

January - March 1961

SYSTEMS Management

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CALIFORNIA
MAR 7 1961



Dr. Gibbs Myers: "Systems Man Of The Year"

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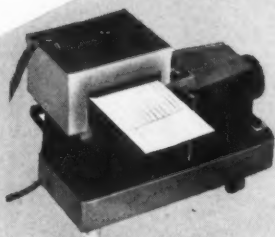
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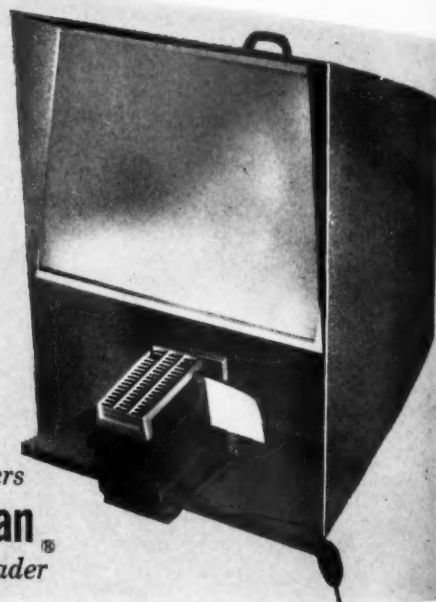
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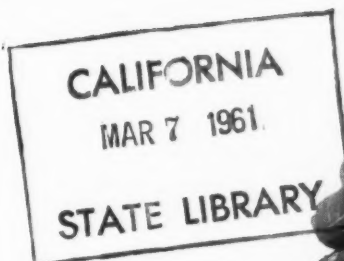


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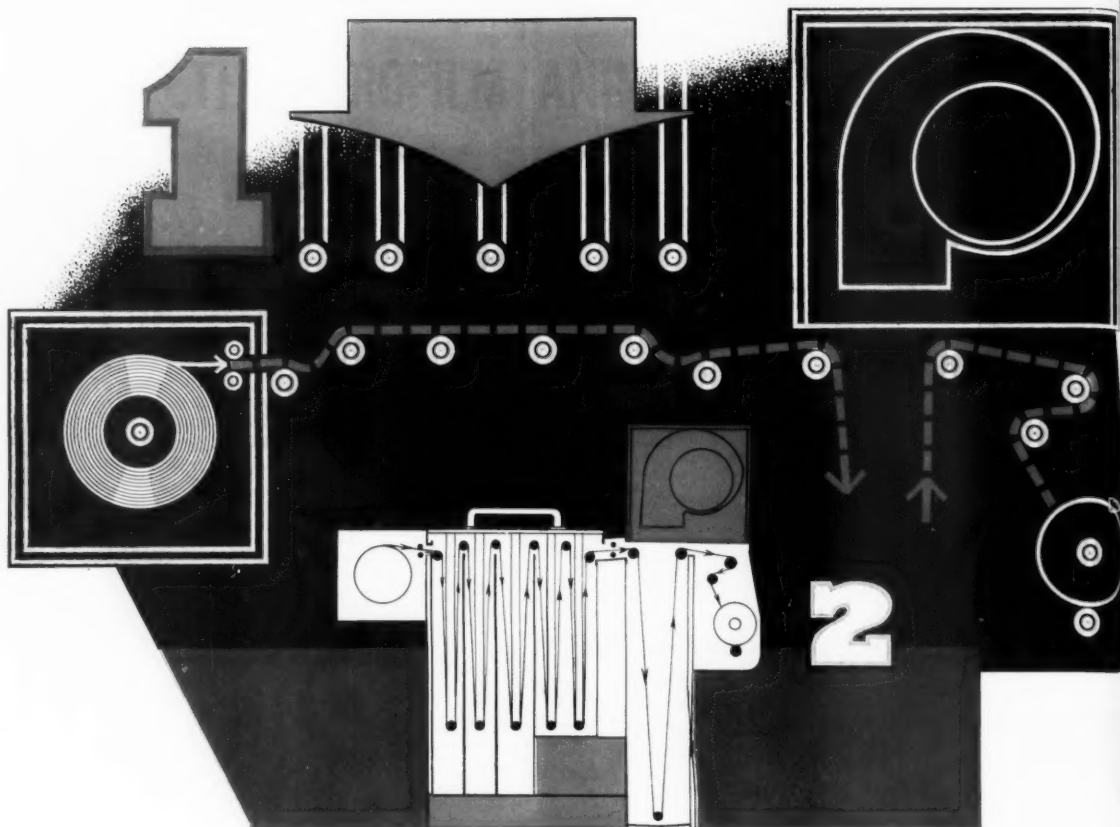


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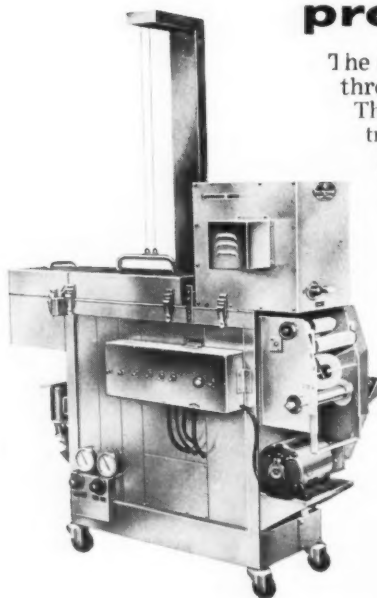
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SYSTEMS Management

January-March 1961

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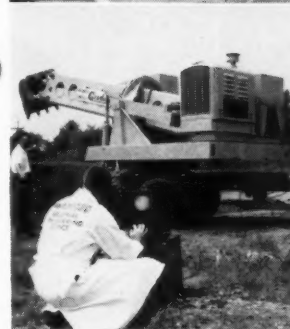
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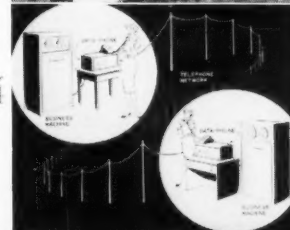
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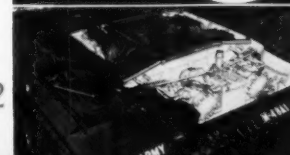
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On the Cover: Dr. Gibbs Myers, Systems Man of the Year, is flanked by (L to R) Sidney P. Herbert and Robert Cassidy. The men discuss an EDP installation at the Kearfott Division of General Precision Laboratory. For further details see page 48.

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EDITORIAL

What's In a Name?

Since World War II the concept of organized information management has taken so strong a foothold that it is universally recognized as an integral part of business, industry and public life. Unfortunately the titles it operates under vary from company to company. This disparity in departmental and individual titles (information management, systems and procedures, data processing, records and/or systems management) often leads to confusion as to exactly what systems men and their systems offer to management. One of the best summaries we have seen of what contribution systems for information management can make to business is this comment by Robert A. Magowan, president, Safeway Stores, Inc.

"A system is a series of functions, steps or plays designed to bring about a desired result. Procedure is the detail of the steps of the system. Through the use of systems and procedures, management can expect its job to operate with greater efficiency, effectiveness and economy than it could without them."

As Mr. Magowan neatly indicates, the system is the plan and the procedures are the implementation through various tools — EDP, microrecording and retrieval, tab cards, magnetic tape, etc. Once this idea is understood, the name confusion becomes trivial. Although it would be wonderful if the information management department and the information manager were to bear the same title in every organization, it is unimportant as long as business and industry recognize their contribution.

It is symptomatic of the youth of this science that nomenclature should still be a bit confused. But we look forward to the not-too-distant future when we can settle on uniformly recognized job and professional titles.

Mitchell M. Badler
EDITOR

Industry News

● New officers for 1961 have been announced by the American Records Management Association. William Benedon, Lockheed Aircraft Corp., is president; George M. Derry, Richfield Oil Corp., executive secretary; Dale S. Kuebler, executive vice-president; Donald A. Schauer, secretary; W. H. Topham, treasurer. Charles Macbeth heads the annual conference committee.

● Massachusetts Institute of Technology reports an interesting statistic of the times: More than 2,000 students and faculty members of 32 New England colleges and universities have learned how to use a powerful digital computer since the M.I.T. Computation Center was opened in June 1957. . . . Perhaps even more significant as a trend of the times is a Saturday morning course in High-Speed Digital Computing for high school students. The course is jointly sponsored by the Washington, D.C. Chapter of the Association for Computing Machinery and the Board of Education of Montgomery County, Md.



DR. PHILIP MORSE, director of M.I.T.'s Computation Center, watches student operator on computer. See story for details.

● The Federation of Management Organizations, a new national management organization, has been formed to coordinate national meetings, research and education efforts among groups active in the management fields.

R. B. Hodges of the Dennison Manufacturing Co., who is also

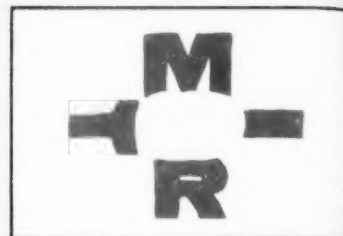
president of the National Office Management Association, is president. Walter Mitchell Jr., executive director of the Society for Advancement of Management, is executive vice-president. The secretary, with offices at 161 West Wisconsin Avenue, Milwaukee, is William P. Youngclaus, Jr., administrative secretary of the American Society for Quality Control.

Thirty-four national organizations are members of the federation which will hold its next meeting in Chicago, March 29.

● Citing the growth of programmed learning as incentive, the Recordak Corporation has established an educational microfilm systems department. The section will work with educators on the planning of programmed learning systems.

● A new automation center opened by National Cash Register Company in New York is claimed to mark a first in business systems services. It makes computer facilities available for the first time to businesses as small as a neighborhood grocery store with only one cash register. Similar service cen-

ters will be opened in more than 100 cities in 1961 with the cost of service running as low as \$25 a month.



● Pictured above is the newly created symbol for MIRT (Management Information Round Table), an informal group meeting monthly in New York to exchange ideas, techniques and experiences in management information systems. Anyone interested in setting up a local MIRT can contact Herman Limberg, chairman, c/o this magazine.

● IBM is reported to have just delivered to the government a new information-retrieval system, cryptically called "Walnut." The system can run through a file of two million documents stored on Kalfax film (a

continued on page 47

Calendar of Conferences

American Management Association. Seminar on planning, scheduling and controlling data processing operations. Hotel Astor, N.Y.C. Jan. 23-27.

National Institute of Management, Inc. Seminar on "Making Reproduction Work for You." Park-Sheraton Hotel, N.Y.C. Jan. 30-31, Feb. 1.

Office Management Association of Chicago. Conrad Hilton Hotel, Chicago. Feb. 27-March 2.

First comprehensive American Management Association Data Processing Conference. Held in conjunc-

tion with AMA's seventh annual exhibit. Statler-Hilton Hotel, N.Y. March 6-8.

American Statistical Association. Chicago Chapter. Eighth annual midwest Conference on Statistics. Congress Hotel, Chicago. March 17-18.

National Microfilm Association. Tenth Annual Meeting and Convention. Sherman Hotel, Chicago. April 4-6.

Office Equipment Manufacturers' Exhibition. Coliseum, N.Y.C. April 17-21.

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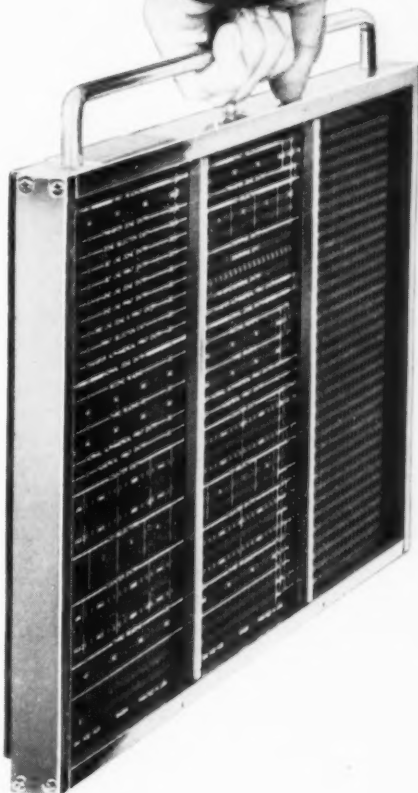
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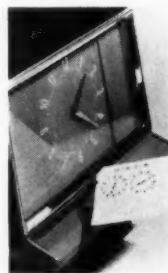
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Power Filing

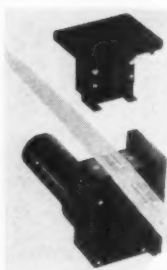
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Designed to handle documents of any practical size, *Diebold Power Files* are available in three standard models with 12, 14 and 16 shelves. All shelves rotate in an upright position with a three-second cycle between successive shelves. The push button-controlled units come with either 38 or 50" wide openings and are said to save considerable floor space compared with standard cabinets. Files come in a choice of colors.



Time Recorder

An automatic elapsed time computer used for either single item computation or as a component in existing cost control systems has been announced by *Calculagraph Co.* The device records start and stop times of a specific job on almost any tabulating card. Programmed to deduct idle periods such as lunch hours, coffee breaks, etc., the *Calculagraph* prints only actual time worked. It will provide timing impulses for be-



Optical Read Head

102

Par Products Corp. has introduced an optical read head for use with perforated tapes. Maximum reading speed is 10,000 characters per second, including time base. Up to nine light beams may be focused into individual cells thru an optical system directly above the paper tape. Light source for the reader is a 10-volt tungsten lamp with high infrared output. The optical system is designed to incorporate dual-beam focusing.



Telephone Data Transmission

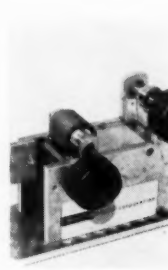
A system for transmission of data from punched cards and paper and magnetic tapes over regular toll or private telephone lines has been introduced by *Dialtronics Corp.* Called the *Dial-o-ver*, the system will transmit as many as 2,000 alphanumeric characters in a three-minute telephone call. It is used with the *Bell System Data-Phone 300* subset and includes error checking facilities.



Tape Telephone Transmitter

103

Friden Inc. has available a new Teledata 8-channel code transmitter receiver for use with the *Bell Data-Phone 100*. Speeds of 425 codes per minute are obtained and parity checking features are included. Designed for use with punched tapes, the unit is activated by push button on each end after the other station is reached by direct dialing. The same rates apply as those currently effective for long-distance calls.



Film Mounter

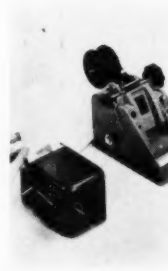
A microfilm mounting machine, the *Model D-2*, which automatically inserts microfilm into the aperture card and cuts the film from the roll, has been announced by *Microseal Corp.* An operator with a little practice can mount from 400 to 600 frames per hour using *Microseal* cards. The compact, hand-sized machine fills the needs for most engineering departments and offices.



Improved Collators

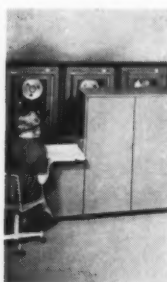
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Thomas Collators Inc. have introduced a series of semi-automatic and mechanical 20- and 32-sheet floor model collators. The tandem-type units now provide complete flexibility in sheet size, stock and finish. Some of the new features include a paper back stop that permits infinite settings for depth of paper, floating action bin assembly undercarriage and run counter. Housing and bin assembly are finished in two-tone.



Card Accessory

Dataflow Inc. has designed a device for use with a mounter that is said to speed the removal of the protective glassine from the adhesive edge of the aperture. With this unit, the aperture card is dropped into the slot window side first. At the touch of a lever the glassine is removed and the card is ready for positioning in the mounter. Experienced operators may increase their production rate in excess of 20% with the device.



Expandable Computer

105

Low cost and expansability mark the new 315 computer system announced by *National Cash Register Co.* Designed for medium and large-sized banks, the unit is capable of fully automating a bank's record-keeping job. Basic capacity is 6,000 characters with add-on capacity of 120,000. A system of buffers permits the 315 to perform different operations at the same time. The processor also includes a high-speed printing mechanism.



Improved Memory Material

A major breakthrough in the field of computer memory speed has been announced by *Remington Rand*. Said to be used in the *Univac 1107* is the magnetic film memory said to permit speeds rated in billionths of a second rather than the present thousandths. Instead of ferrite cores, tubes or drums the film is coated on a material such as thin plate glass to a depth of a few millionths of an inch.

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Miniaturization Report No.2

Micro-Master[®] 105/35mm as a dynamic in-plant tool

Today, the miniaturization system which does no more than microfilm engineering drawings has won but half the battle. The other half consists of rendering versatile service as a drafting and reproduction tool. Only in this way does the equipment become a money-maker instead of a capital expense. MICRO-MASTER 105/35mm by K&E is the system that saves money, speeds production, greatly expands the capabilities of an engineering reproduction department. True, MICRO-MASTER does reduce drawings to miniature negatives and project them back to full or half size. But it goes beyond this to perform a host of other functions — some of which we will outline here.

REDUCED SIZE PRINTS. The growing use of "half-size" working prints is saving industrial reproduction departments a fortune in material costs. This is how the system can work: reduce originals on either 105mm or 35mm negatives. Make blow-backs on transparent material to one-half the linear scale of the original — which actually is one-fourth the area. Diazo or blue-print paper consumption will be reduced by *three-fourths!* Of course, the photo-image must be impeccable, never losing a detail. Projection prints must be pin-point sharp, clearly readable. The burden is on the camera-projector, and only MICRO-MASTER can deliver the quality and range needed by most companies. A 35mm unit alone won't handle larger drawings because of the great reduction necessary to put them on a negative less than two inches square. Only 105/35mm used in conjunction deliver a complete half-size program.

SCISSOR DRAFTING. Drafting departments are often requested to retain elements of a drawing, and add new details. Or they may be asked to combine portions of different originals. Rather than re-trace or start from scratch, modern practice is to scissor out the needed elements, place them on a new title sheet, make additions, and photograph the resulting composite. MICRO-MASTER serves as a vital tool for this time-saving, cost-saving technique. Second-originals are made from 105mm or 35mm negatives. The elements are cut out

and pasted down with transparent tape. New details are entered, and the entire drawing filmed and projected for a final, ink-like original — comparable in every way to the most meticulous hand work. Even if the elements abstracted are to different scales, they can be brought to a common scale easily and quickly with the MICRO-MASTER Camera-Projector. A drawing that would take 20-30 hours of a draftsman's time can be produced photographically in less than an hour!

OTHER DRAFTING TECHNIQUES. In printed circuitry, layouts done several times up can be reduced and printed on stable-based materials to microscopic accuracy. Plant layout work can be done with no drafting at all — simply by placing various pre-printed components on a master sheet. Tone-coded prints in which old work is distinguished from new by a light half-tone screen, can be produced in the projection stage.

RESTORATION. MICRO-MASTER offers exclusively controlled front and back lighting to build up contrast in badly soiled drawings. A vacuum easel holds drawings perfectly flat for the camera. Result: high-contrast, superb-quality negatives and prints — up to 42" x 63". Users have found that close to 90% of their aged tracings can be restored like new, practically eliminating costly hand re-tracing.

DISCARDING OF ORIGINALS. Since MICRO-MASTER produces projection prints of a *least* equal quality to the original itself, all originals can be discarded. On one case, 200,000 originals were replaced with 200,000 MICRO-MASTER negatives, reducing storage area from 1,400 to only 30 square feet!

To repeat: a miniaturization unit falls short if all it can do is record images. Far more can be, and should be, expected of it. For the unit that does the most jobs, and does them to the highest quality, the choice is MICRO-MASTER. We'll be pleased to give you further information — facts, figures, case-histories. Simply return the coupon below.



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Microfilm Topics

by HUBBARD W. BALLOU
Columbia University Libraries



Applied Microcopying

Applied microcopying (as opposed to experimentation) has a relatively short history of thirty years. In that period the greatest developments have been in the field of equipment for producing and using microcopies. In the last twenty years, for example, the number of microfilm camera models available in this country has jumped from just over twenty to just under sixty. As well as growing in numbers, this equipment has become more versatile. New film sizes have been added, reduction ratios have been pushed beyond what were considered safe limits thirty years ago, and ribbon microfilm has been given new dimensions with unitization and electrostatic printing methods.

It has come to the point where we begin to wonder if perhaps we are not surfeited with an excess of riches. Has the versatility of our equipment made us slack in our planning for microfilm projects? Our cameras and processors are so well designed that they are almost automatic. In a well-equipped microfilming laboratory, the time between introducing the material to the camera and the completion of the film is very short. In nearly every case, this time is a small percentage of that used in getting the material to the camera. Experience will show, however, that every minute skimped in the preparation for a microfilming project will result in many minutes wasted at later stages. It is at these subsequent use-stages that microfilm will either pay off or become a deficit item.

The American Library Association has been directing its attention to microfilming for most of the thirty years mentioned above. Its interests in this medium are parallel to those of most professional associations — there is no exact duplication of in-

terest among users, whether they be bankers, scientists, engineers or scholars. As with all professional associations, what progress is achieved comes from the work of committees and from cooperation with committees of other organizations. A quick look at some of the A. L. A. programs arising out of this involvement in microcopying may give a picture as to the need for more and immediate work in the planning for microfilm projects.

Before a microfilming program even reaches the planning stage one must decide what one wants to microfilm. In industry this is usually immediately apparent — the company's engineering drawings, correspondence, records or invoices are taking up too much space and are not readily accessible. This is true of libraries as well, but they are also interested in materials located outside their own walls, often in foreign countries.

A project sponsored by the American Council of Learned Societies (with cooperation from the library profession) is looking into the many problems arising out of the photocopying of foreign collections. This program is headed by Lester Born of the Library of Congress.

Another problem that is not usually found in industrial microfilming is that of duplication of effort. In libraries it is disheartening news to learn that someone else has just completed a job (always a difficult one) that you are now engaged on. Lack of cooperation is responsible for this. A subcommittee on micro-publishing projects, under the chairmanship of James E. Skipper of the University of Connecticut, has this as one of its interests. It is also engaged in an attempt to smooth out the problems arising between publishers and purchasers of large-scale

microform projects. A proposed standard contract form has just appeared, and the committee is soliciting comments and suggestions on it.

Manufacturers of printed books have had over five hundred years of experience in getting their information into the hands of the reader in a form acceptable to him. Microcopy editions can use some of the same techniques; but they often face problems arising from their inherent smallness, the peculiar form that they take, and the necessity for using reading devices. Bibliographical control is a term used by librarians to mean the many techniques they use to make the information in a book readily available. A study on bibliographic control of microforms, sponsored by the Association of Research Libraries under Wesley Simonson of the University of Minnesota, is looking into this problem.

Standardization makes it possible to integrate products from many sources and make them useable by a widely varying public. A committee of the American Standards Association designated by the code letter PH5 is interested in standards having to do with document reproduction. A library group has been set up to ensure that standards produced by ASA PH5 are available and publicized among libraries and that specialized standards peculiar to library applications are prepared. This is the Library Standards for Microfilm Committee under the chairmanship of Peter Scott of M. I. T.

When a book is published, one can usually find reviews of it in many sources. The more esoteric titles are reviewed in the specialized journals. Microforms are being used for more publishing and re-publishing projects than ever before, but there has been no concerted effort to ensure that the publications are reviewed. A program for soliciting critical views of micropublication projects has been set up, to be coordinated by Gustave A. Harrer of Boston University. These reviews will be published in *Library Resources and Technical Services*.

Library photoduplication departments in their daily activities tread a

continued on page 29

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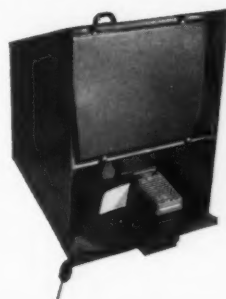
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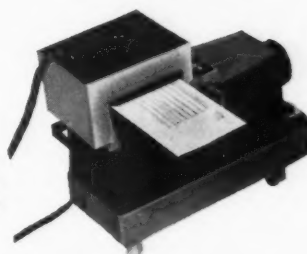


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Circle No. 501 on Post Card

Information Management

by HERMAN LIMBERG

Director of Management Reporting
Office of the City Administrator, New York, N.Y.



Awareness and Appreciation

Looking back at the past half-century it seems amazing that the great achievements of American business, industry and government could have been possible without the benefits of *information management*. Paradoxically, however, some of these achievements, particularly the technological advances attributable to electronics, have created an awareness and appreciation of information management. This again proves Thorstein Veblen's observation that invention is the mother of necessity. Progress in technology is invariably accompanied by the generation and accumulation of new data and information. These new accumulations produce additional paperwork which resists and impedes the push of progress. Hence the necessity of a new management science to prevent the frustration of inventive genius.

In *The Practice of Management*, Peter F. Drucker asserts that "scientific management has been stagnant for a long time. During the last thirty years, it has given us little but pedestrian and wearisome tomes on the techniques, if not on the gadgets, of narrower and narrower specialties. There are, of course, exceptions. But on the whole there have been oceans of paper but few, if any, new insights." Effective information management counteracts stagnation, narrow specialization and the flood-tide of paperwork; even more important, it compels new insights into the art and science of management.

The prime purpose of information management is to provide, efficiently and economically, the information needed for planning, di-

rection, evaluation and control. The total complex through which such information is generated, compiled, processed, refined and used is a *management information system*. The foundation upon which this system should be structured consists of the following elements of the *administrative sequence*:

(1) Clarification of the *Mission* of the enterprise and of each of its components. The mission, which is the primary purpose for which the enterprise or component was established, should be stated in broad, general terms; it ceases to exist when the purpose changes or ceases to exist. The mission of the corporate enterprise is set forth in its charter which should be reviewed periodically for guidance and inspiration.

(2) Formulation, review and analysis of budgeted *Programs*. A program is a group of related functions and activities directed toward the accomplishment of the mission. Examples are: Sales Programs, Production Programs, Expansion Programs, Profit Improvement Programs.

(3) Development, formulation and adoption of program *Objectives*. An objective is a specific, measurable goal, expressed in such terms as quantity, quality, time, frequency, ratio, percentage, and cost, which is to be achieved within a stated period of time — both long-term and short-term. Examples: To achieve annual growth of 20% for the next five years through expansion and extension of present and related product lines, by increasing annual sales by \$15 million and net worth by \$8 million. To realize a minimum of 14% net profit on sales be-

continued on page 39

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DESK UNITS on wheels carrying an operator and a "Thermo-Fax" Selective Copier are shown at work in the insurance records department at the Veterans Administration district office in Philadelphia. The mobile units are part of a new data retrieval system that has substantially reduced the time involved in handling individual insurance policy matters.

Making A

by JAMES HUGHES

In the October issue of *SYSTEMS MANAGEMENT*, we surveyed the changeover to magnetic tape data processing by the Veterans Administration's Department of Insurance. This changeover presented the thorny problem of rapid and accurate retrieval of information pertaining to transaction histories of particular insurance accounts for processing correspondence, claims, underwriting and similar actions.

Accumulation of such information on tape would necessitate the storing of far more reference reels than would be economically practicable to maintain. Yet such information is important to daily transactions, of which there are about 150,000 a day.

A Difficult Task

The recovery of this historical data was difficult before the computer system was installed, when posting of the various records was handled manually. Now an IBM 705 electronic data processing system is absorbing the posting, and the manual records have been eliminated. This leaves the daily transaction list as the sole source of historical reference.

To provide a fast and accurate method of recovering this past information, representatives of the VA, working with the Minnesota Mining and Manufacturing Com-

g A Rapid Recovery

The Veterans Administration's Department of Insurance has solved the thorny problem of rapid and accurate retrieval of information with the help of a customized copier.



SELECTIVE COPIER moves down a bank of insurance records.

pany, developed a specially designed Thermo-Fax Selective Copier which can retrieve case history data from printed lists, one at a time.

Desk-And-Chair Assembly

The Thermo-Fax Selective Copier is mounted on a desk-and-chair assembly that glides along the side of a lateral magazine-type file. Both the assembly unit and the files were supplied by the Rol-Dex division of the Watson Manufacturing Company.

The magazine-type file houses index guides designed by the Smead Manufacturing Company which segregate transaction list material according to normal numerical sequence of the days of the year; i.e., from one through 366. Thus, April 15, 1960 is the 106th day of the year, so the guide for the day would be #106.

When information on an account is required, a status request sheet is prepared. A card is punched from this sheet, and along with other transactions for that day, the card is converted to tape. The computer, in turn, produces a Record Print Out, reflecting all pertinent details, contractual and otherwise, of the account in question.

If additional data on previous transactions are required, a notation is made on the Record Print Out to indicate the extent of the

background information desired. The Record Print Out is then forwarded to a Thermo-Fax operator in the records area. No special aptitude or degree of intelligence is required by the operator. The equipment is easy to operate, so its operation is easily taught and quickly learned.

Only Three Entries

The operator needs only three entries imprinted on the Record Print Out to facilitate her search for past transactions. These are the file and policy number of the account and the last day it was processed.

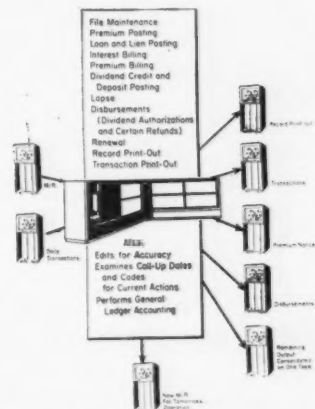
Using this information as a guide, the operator extracts the proper transaction list from the Trans-Dex file and inserts it in her machine. The line, or lines, of data requested are selected by positioning a row of pin lights which extends across the width of the transaction list sheet. She then depresses a button at the right of her machine, which activates a roll of copy paper.

The data is copied instantaneously and in dry form, and then automatically sliced off on strips of paper measuring three and one-half inches in length. These drop into a receptacle at the base of the machine. The strips are relayed to those requesting the information, and the transaction list is replaced in the file. At this point the Thermo-

Fax operator's work is done. It takes an average of less than 30 seconds to identify, locate and recover a single line of insurance account history.

The Thermo-Fax unit will accept pages of any length up to 15 inches wide. Single lines containing a maximum of 120 characters may be copied, and by touching a multiprint button as many as seven lines may be reproduced.

This records retrieval system, located in the department's Philadelphia office, has successfully broken the road block to a completely integrated data processing program, which is being watched with considerable interest by the entire insurance industry. □



TYPICAL daily processing run.



INPUT AND OUTPUT. The first step in Cutler-Hammer's aperture card program is the actual microfilming (top). Key punching is the next step (center). To interpret a parts order, a card is examined in a viewer (bottom).

Microfilming Means Many Things

by J. E. JONES, Manager of Drafting, Cutler-Hammer, Inc.

Our company has four plants including major engineering and drafting areas in Milwaukee. Each year about 16,000 new drawings and 35,000 changed drawings are created. To service our plants in Milwaukee, plus our customers' needs, the plant in Lincoln, Ill., and two on the West Coast, we make about 400,000 prints monthly.

A review of our microfilm programs for security, space savings, reference and print service will show how we have tried to take advantage of this technique.

Microfilm for Security

Because of our large number of revisions, we decided against security microfilm in rolls. We feel it would be next to impossible to sort out revisions from the frames of roll microfilm. We, therefore, decided to card-mount our security film and keep only the latest revision.

In the event of disaster, we feel there will be priorities in reconstituting from the security file. The most important drawings to be reproduced will be those needed immediately to get back into business. We feel we have provided for this by mounting the film on tab cards, with the necessary sorting data punched into the cards.

In the event of disaster, consequently, our security program will enable us to schedule our reproduction from microfilm to meet the company's priorities to get the most production from the best available equipment.

Microfilm for Space Savings

Our card-mounted security program also makes possible a space-saving program.

The quality of microfilm images

Cutler-Hammer is a "medium-sized" company that gets lots of mileage out of microfilming.

has improved to the point where engineering departments actually have the courage to destroy drawing originals. But to make a drawing destruction or retirement program work, the microfilm should be stored in unitized form instead of on a roll.

A series of drawings, even a modern series, contains many inactive drawings which can be destroyed. Interfiled with these drawings are the active drawings needed for renewal parts, patterns or tools.

With a roll film file, spot drawing destruction year after year would be impossible. On the other hand, such spot destruction is possible with a card-mounted security file which permits the latest revision to be maintained. The film card is simply stamped "tracing destroyed."

Our unitized system of card-mounted film for security enables us to destroy drawing originals as fast as we make new ones. Consequently, we have obtained a balance of space for drawing records and achieved considerable savings in file equipment and floor space.

Microfilm for Reference

In some situations, a working microfilm file has exceptional merit for reference. Such a situation occurs when a group or department needs ready reference to a large volume of material. In the original format, space and filing equipment probably make such reference activity impractical and uneconomical. But with microfilm, improved performance at a definite cost savings is practical for such reference activities.

A typical example is our Renewal Parts Department. It handles inquiries and orders for equipment

built since the turn of the century. It needs access to original order papers, engineering data, specifications and drawings of all vintages. Over the course of a year, our Renewal Parts Department estimates it must examine some 45,000 drawings to interpret parts orders. For efficiency, all this material should be conveniently located and readily available to all members of the department.

In a renewal parts operation, the usual tracing of a part may require the examination of three drawings before the actual information is obtained. Obviously, three lookups to find one reference can create serious problems in finding, pulling and re-filing engineering data.

After considerable study to improve reference access for our Renewal Parts Department, we decided to provide it with its own set of microfilmed engineering drawings. The parts interpreter editors pull their own cards, look at the film and then put the cards in a box. Clerks do the re-filing. We find this self-service is the fastest service.

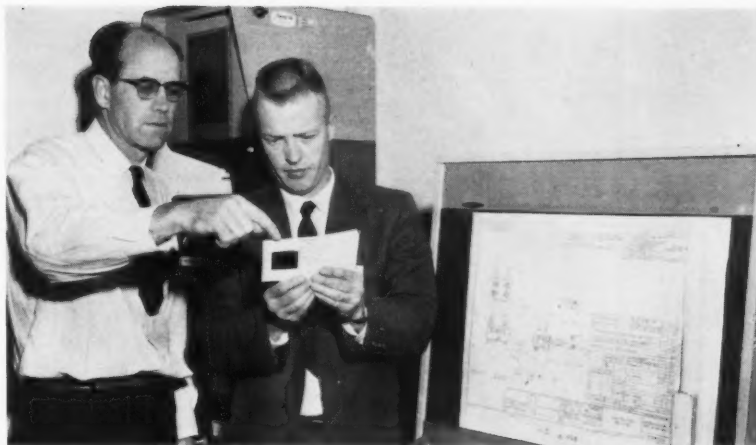
Furthermore, with full information at point of use, there is no back-tracking in ordering prints and no waiting for delivery. The editors can pull two or three cards to find the microfilm needed to complete the parts order. With this reference system, we are able to provide faster service in parts orders.

In our renewal parts operation, we consider microfilm as a reference tool. Actually, it is a part of a systems procedure to complete parts orders. The fact that we can reduce drawings to a standard format in cards and find cards with ease should open up new systems procedures for microfilmed drawings.

Our print service from microfilms, at present, is confined to blowbacks of destroyed drawings. Today's volume is relatively small, but as more drawings enter the retirement system, we perhaps will have larger output.

In many areas, we feel that prints are preferable to microfilm for reference purposes. Therefore, we have worked to improve print service. Too often, we are apt to con-

continued on page 44



LARGE COPIES of engineering drawings from aperture cards are made in less than 10 seconds at the Army's Pueblo (Colorado) Ordnance Depot by pressing a button.

What A Difference A Little Automation Can Make!

Army conducts pushbutton war on reproduction problem.

What a difference one kind of equipment can make! At the U.S. Army's Ordnance Depot in Pueblo, Colorado, *extra copies of engineering drawings are made easier and faster, retrieval of records from files is simplified and costly man-hours are saved* — all because of the installation of new automatic microfilm reader-printers.

Less Than 10 Seconds

The Minnesota Mining and Manufacturing Company units turn out clear, hard prints in less than 10 seconds. Aperture cards are merely inserted, a button is pushed and working prints emerge ready for distribution without delay. One unit makes 8½ x 11 copies, while the other is used for larger 18 x 24 prints.

With printing volume at an average of 200 per day, rush assign-

ments have pushed the total above 1,000 at times. "On those rush days," says Velpo Lester, chief of the Engineering Data Unit, "we simply couldn't survive without our reader-printers."

Save Many Man-Hours

Lester goes on to say that the new units have saved the Pueblo Ordnance Depot as much as three to four man-hours each day. Charged with missile overhaul, modification, fire control and rebuild, the Depot's filing and retrieval problem in the past involved delays and heavy expense in the duplication of engineering drawings.

Next improvement on Pueblo's schedule is automation of aperture cards, which are currently being converted from the present manual retrieval to standard electric accounting machine methods. □

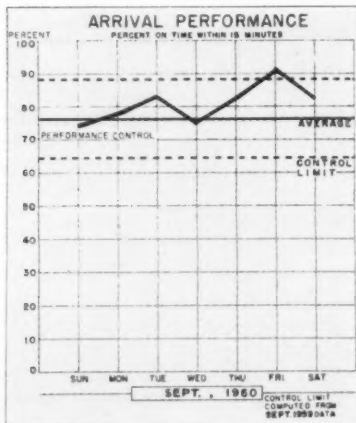
Visualizing Management Reports

Facts and figures for a wide variety of A-V instructional aids are provided by United's data processing center. Result? Management is kept up-to-the-minute on aircraft operation and maintenance.

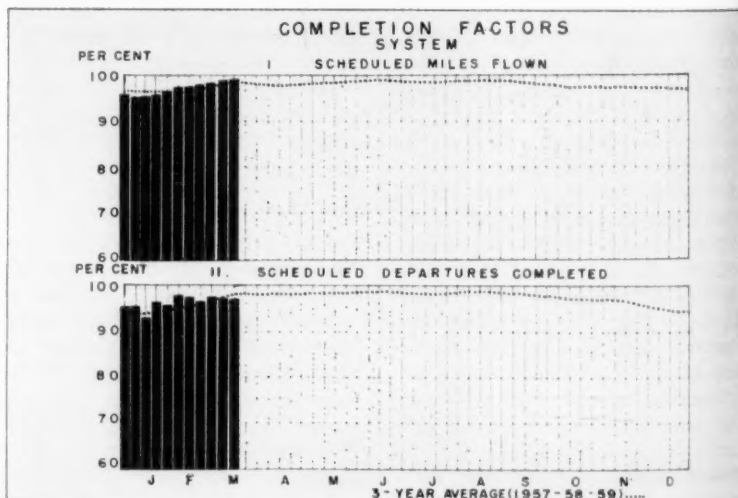
by JACK MURPHY, Statistics Manager, United Air Lines



BOARD ROOM is scene of wall presentations illustrating monthly and annual performance trends. Data is supplied by EDP center.



CONTROL chart posted in briefing room.



VIA PHONE management discusses charts such as the above showing operation statistics.



Only two messages per take-off routed from the field to a data processing center are necessary to keep United Air Lines' management informed as to operating efficiency. All raw data required for an effective reporting system is contained in these messages and derived as an integrated part of operations.

Twenty Minutes

Duplicates of both messages are sent by teletype at departure time and are received on an average within 20 minutes at the source data collection unit at United's operating base at Stapleton Field, Colorado.



AT DAILY BRIEFING SESSION managers preside at wall-size maps and charts to report on traffic and performance within past 24 hours.

At Stapleton Field the messages become part of an operation which involves over 30 people who are responsible for collecting and processing information from over 3,000 teletype messages sent seven days a week. Also part of the operating base is a well-equipped data processing center.

The first of the messages is the load dispatch, or meter, which indicates the pounds of mail, express, freight, company material, baggage and customers to be loaded. The dispatch starts to accumulate when customers check their tickets and baggage at the terminal.

This information is passed on to a local load planning group who allocates weights over the plane. For pre-planning loading at subsequent stations on the route the group compiles a load dispatch which is forwarded to the next downline station. When the dispatch is complete it is teletyped to the operating base.

Flight Movement Bulletin

The second message is the flight movement bulletin compiled by the local airport. This message gives the trip number, date, plane number, station involved, when the plane lands on the runway, goes up

to the gate, away from the gate and takes off from the field. One copy of this goes to downline stations which are enabled to follow the airplane as it speeds across the country.

The data processing center receives this teletyped information and produces over 45 statistical reports daily. IBM data processing equipment is used exclusively at the center. A 607 calculator now in use is soon to be replaced with a Series 1400 processor.

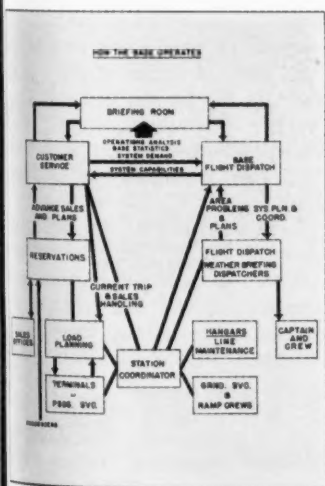
Schedule Patterns

IBM cards with information on the schedule patterns are prepunched (see this page). As additional messages are received new information is key-punched into these pattern cards.

Other components of the management reporting system are the statistical data audit and the statistical reports units. The former insures the accuracy of the statistics used in reporting while the latter prepares long-range reports and charts.

Here is how the entire system makes possible prompt and accurate management reports:

The following information is immediately available from the data processing center on every trip for every day: the trip number, date of operation, sequence of flight, equipment used on each segment of the flight, any delay in minutes at the



FLOW CHART shows how reservation is routed from time customer steps into sales office to request space on flight.

UNIT		LOAD DISPATCH MESSAGE	
CA356	KEDCHLP 60 161730		
ONALP	DRPFC DRRP		
436-16 PM 6547 2200			
1740-1730 25° LPC			
NORL 18-1-390			
		CHI 19-1-234	DCA 6-0-66
E136	7-137	CHI 6-133	
AF 0	13-741	CHI 4-163	
CO 74	7-69	CHI 11-630	
OIA 2-13		CHI 3-67	
S 304	72-1612	CHI 27-594	DCA 17-347
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LOAD DISPATCH (top) and pattern card.

particular station causing that delay, number of revenue and non-revenue passengers loaded at each station, etc.

Vu-Graph Process

All varieties of audio-visual instructional material are quickly prepared from this. Most of these aids center around the Ozalid Vu-graph transparency process. However, these are converted to 35mm slides when the occasion demands.

Promptly at 8:30 each morning a ten-minute briefing session takes place to discuss irregularities that have taken place over the past 24 hours. Attending the meetings are United's top executives plus the managers of weather services, aircraft maintenance, customer services and operations planning.

There are a series of quality control charts, bar and line graphs measuring daily performance posted on the briefing room wall. The norms of these are determined by the actual accomplishment for the same month last year as are appropriate upper and lower control limits.

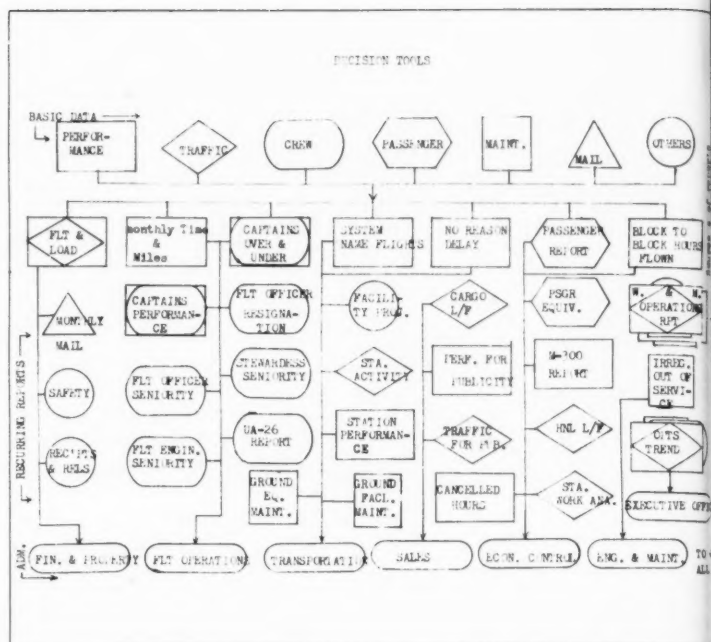
An equipment panel in the briefing rooms shows the total fleet by type of aircraft and by assignment which indicates the number of aircraft required to fly the daily schedule, the number of necessary back-up aircraft for routine maintenance, for irregular out-of-service, and for major overhaul. Again, this raw information is provided by the base data processing equipment.

The panel is constructed of half-inch thick plastic which is edge-lighted at top and bottom. The figures are posted on this plastic with a white soap base crayon. These crayon marks are illuminated by light transmitted through the plastic panel.

Airline Map

A wall-sized airline map is equipped with three lights at each of United's key terminals. Operating status is posted every hour as to weather, maintenance and passenger delays through the media of flashing lights.

Another panel containing current postings as to performance for the



130 DIFFERENT management reports such as the one above are sent to management each month to aid them in policy decisions. They are made possible by the data processing equipment below.



previous 24 hours gives the operating group up-to-the-minute accounts of daily accomplishment. The percentage of daily scheduled miles and departures completed, the percentage of aircraft arrivals on time and the percentage of irregular aircraft maintenance evaluate the job accomplished.

On Tuesday of each week an analysis is presented to the staff by a senior analyst. This is a presentation of graphic charts covering each important area of operation during the past week. Through bar graphs, weekly accomplishments are compared to historic norms, profit plan and trend lines.

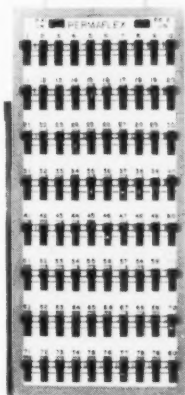
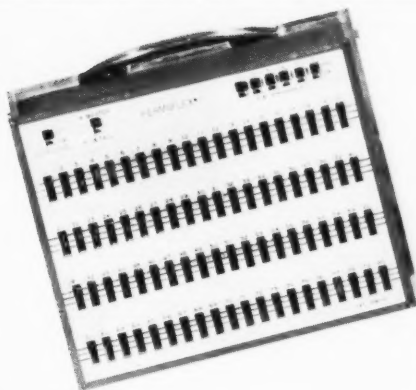
The meeting is conducted as a telephone conference connecting San Francisco, Denver and Chicago. The analysis is given in Denver — duplicate charts are presented at the same time in Chicago and San Francisco.

Going beyond the daily and weekly reports the data from the console is used to show trends. This information is charted for wall presentation in the board room. Performance by type of equipment and service from point of origin, at point of arrival, on the ground and in the air by type of equipment, by type of service and by station is summarized. See page 18 for a typical chart.

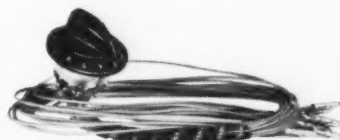
Each month 130 different management reports are compiled and sent to 172 different organizational elements. These compilations are referred to as decision tools as they are hand-tailored for each department's use.

Special reports used to require days of processing. With the management reporting system built around data processing equipment these reports are completed in a matter of hours.

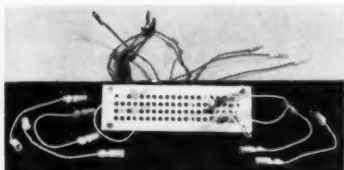
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DIAL SWITCH, with 11 positions, makes it possible to change dates and similar functions by dialing. Mounts directly on panel covers to facilitate wiring changes to complex panels. Price \$7.50 each.



SELF-CONTACTING, PIGGY-BACK — 80 hubs available for all types of machine functions requiring alterations may be controlled by external flexible wiring without removing the cover. Fits all self-contacting covers. Price \$25.00 each installed in your cover.



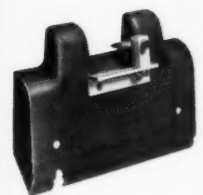
ALTERATION SWITCHES for rapid set-up of changes. Panel switch (right) used on panels without covers is plugged into unused hubs by two dead prongs. Cover switch (left) for fixed panels, mounts on the cover. Both switches are pluggable with self-contacting wires of any length making them usable on any size panel. Price \$3.50 each. Specify type.



CONTINUITY TESTER for checking wiring locations on heavily wired panels. Spring clip is attached from the back of the panel to the known wire end and the probe is used to test for the opposite end. Price: \$2.50 each.



CARD MARKER for card punch and verifying machines makes it possible to detect the source of "off punched" cards and operator errors. Attached to the card hopper mechanism cover it marks cards in one of 20 columnar positions. More units can be identified if various colored refills are used. Prices: 1 to 5, \$10.00 each; 6 to 10, \$9.25 each; 11 and up, \$8.75 ea.



Now, from TECH Panel, come new time and labor saving accessories. These job-tested units were designed to make your data processing assignments easier to accomplish. They're built to the same high quality standards as TECH control panels to assure you of dependable, accurate operation *every time!* Contact your TECH Panel Dealer for all these accessories. He also has a complete stock of control panels available for immediate shipment. Contact him today or call Binghamton, N. Y., RAYmond 3-8232 for expedited service.



FILTER WIRE permits electrical impulses to flow in one direction only! Small in size, having either a manual or fixed self-contacting terminal at one end, it takes no more room than a standard wire. Price \$20.00 per dozen.

WRITE FOR FULL INFORMATION

Tech Panel Company Inc., 37 Milford St., Binghamton, N. Y.

Please send me data on Tech accessories and the name of nearest Tech Dealer.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

TECH PANEL COMPANY INC.

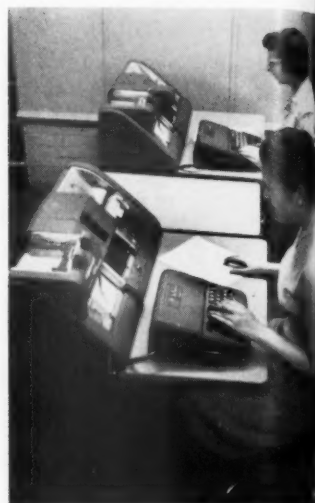
37 MILFORD STREET
BINGHAMTON, N. Y.

Circle No. 518 on Post Card



ESTIMATING CLERK picks card from tub file.

Overtime is a thing of the past for the Mengel Company bookkeeping department, where employees use modern accounting machines for . . .



IBM 024 PUNCHES produce data on card

Shortcutting Paper Box Cost Estimates

by JAMES F. TATE
District Manager
Mengel Company

For many years the Louisville plant of the Mengel Company, manufacturers of corrugated containers, has used the conventional charts and costbooks which are standard equipment for solving tricky cost-estimating problems in industry. While the charts and costbooks did the job in the days of large, centrally-manufactured orders, we felt they were incompatible with our present trend toward plant localization.

With shipping distances rapidly shrinking, quick and accurate service became a greater factor in sales volume for our company. The unwieldy structure of a standard estimating system did not readily adjust itself to fluctuating costs and conditions. Clearly there was need for a new system based on modern machine accounting equipment.

As the first step toward this mechanization we revised the basic philosophy of our estimating meth-

ods. Our new system, based on averages, eliminates the need for constant cost studies and is completely flexible to meet changes in labor and material costs. It deviates from the standard approach in two basic ways:

1. It is based on a history of average costs maintained by periodic spot checks rather than the normal procedure of running a cost study on every order.

2. In the normal course of figuring running expenses, we calculate and separate a "conversion figure"—the cost of converting X-number-of-sq. feet of paper into boxes.

Computing Conversion Figure

This conversion figure is easily obtainable by adjusting costing procedures. It is simply the figure obtained when "burden"—overhead, depreciation, investment, etc.—is added to labor costs. A comparison of this figure to profit and loss statements yields a running check on our estimating procedure. It assumes further importance as the basis for our various incentive

plans. The conversion figure has also become our measure of plant volume.

While streamlining our cost-estimating methods provided us with more reliable and current information, the system remained a manual one and did not answer the need for increased speed. Further investigation revealed that our estimating system was easily adaptable to machine accounting techniques which would provide faster, more accurate and more economical estimating service.

Quicker Estimates

Shortly after the installation of our IBM punched-card data processing equipment this was demonstrated. It was found that our machine accounting department not only did the same amount of work with fewer people, but also provided us with more complete information at a lower operating cost.

In addition to servicing our own estimating needs the department also provides 24-hour service on short-deadline estimates for each of the

Mengel Company's nine plants. The speed and accuracy obtainable through machine accounting methods is a vast improvement over the cumbersome workings of a manual system. This speed is a product of the uncomplicated structure of our mechanized system. Here's how it works:

The sales service department submits its price requests to the machine accounting department on paper forms containing all pertinent information — size, type, construction, test, color, etc. This information plus the scoring allowance, is transformed to punched cards on our IBM 024 Card Punch.

The resulting cards are mechanically verified to insure the accuracy of the punched information and placed in the calculating punch to determine the sheet size of material needed to produce the carton.

Cards From Tub File

An experienced estimating clerk, working from the original request, chooses the appropriate operational cards from our "tub file" of over 700 separate operations. Each card contains the pre-punched individual cost estimate for that particular operation. This is a manual operation because of the complexity of charges which may or may not be applicable to the order.

These charge cards, along with the key-punched information cards, are fed into the calculating punch, which electronically computes the final cost estimation and issues a punched card containing this figure.

All cards are then inserted in our accounting machine, which produces a printed form containing all information received from the sales service department, each individual charge and the resulting total cost estimation. This printed form is then returned to sales service for transmission to the potential customer.

A single estimate may contain up to 70 separate parts, each of which requires at least three cards. A man-

ual computation of cost figures on a container of this complexity would entail many man-hours. Machine accounting is able to produce this same estimate in a matter of minutes with assured accuracy.

In addition to performing efficiently all cost estimation operations, our data processing equipment also handles the factory payrolls, accounts payable for, order acknowledgment, invoices and a monthly inventory of finished and in-process containers. The invoice operation provides us with two important by-products:

We are provided with a complete monthly sales analysis, including a breakdown of all sales accounting and bonus information.

The sales analysis data has proved to be especially valuable in the realignment of sales territories on a profit-per-customer basis.

We are now able to close accounts after the completion of a full month. Previously, we had to close the books on the 25th of the month in order to allow for balancing. By closing on the 3rd of the following month machine accounting has eliminated the substantial carry-over formerly necessary.

No Overtime

A real advantage of machine accounting is the fact that all operations are processed without need for overtime or additional office help. This has held true, even under peak conditions of 25 per cent over-average work load.

Our machine accounting department, with its present equipment, easily handles our present paper-work load. Its operation at about 70 per cent of capacity leaves us with sufficient capability to handle expected future expansion for some time to come.

We feel that the speed, accuracy and economy of our mechanized accounting methods has given us a definite competitive advantage in the corrugated container industry. □



CHARGE CARDS with information cards are fed to calculating punch by clerk.



GENE REDDEN, machine accounting head, reads printed estimate figures.



AUTHOR scans figures to be incorporated in Mengel cost-estimating system.



now... 3M makes microfilm so easy to use

■ Each month more and more companies are turning to

microfilm for engineering drawing reference systems. The advantages are many—greater security plus considerable savings in manhours, materials, and reproduction costs. But, the most important reason is that 3M's new THERMO-FAX "Filmac 200" Reader-Printer and FILMSORT Aperture Cards make microfilm so practical—so easy to use. ■ The "Filmac 200" Reader-Printer combines the advantages of a reader and a printer in a single low-cost unit. You can refer to the enlarged drawing clearly projected on the big viewing screen, and make a work-size print in seconds. You can take more than a look—you can take a copy. The time savings are obvious. ■ The THERMO-FAX "Filmac 200" Reader-Printer lets you

make copies of what you need when you need them.

So low in cost, it puts micro-

film in reach of even the smallest industrial firm and engineering department. ■ FILMSORT Aperture Cards are the punch cards that make microfilm so easy to find, file, and use. They standardize engineering drawings and records. They consolidate pertinent data. They shrink file space. They speed retrieval of information. They simplify dispersal of needed facts. They raise efficiency and lower overhead. Long used by government and industry, FILMSORT Aperture Cards are designed to meet Department of Defense specifications and standards.

■ Call your local dealer or mail the coupon now for complete information about how 3M Microfilm Products make microfilm so easy to use.

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BRAND
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THE TERMS "THERMO-FAX" AND "FILMSORT" ARE REGISTERED TRADEMARKS OF 3M CO.

MINNESOTA MINING AND MANUFACTURING COMPANY

St. Paul 6, Minn.

Minnesota Mining and Manufacturing Company
Dept. FBZ-11, St. Paul 6, Minnesota

Please send me complete facts on the new THERMO-FAX "Filmac 200" Reader-Printer ☐, on FILMSORT Aperture Cards ☐.

Name _____
Title _____
Company _____
Address _____
City _____ Zone _____ State _____

... WHERE RESEARCH IS THE KEY TO TOMORROW



Circle No. 512 on Post Card

Financial Weather Forecasts

by JAMES HUGHES

A huge computer saves the C&O almost \$7,000,000 yearly—it spots financial clouds forming on the horizon!

Simply stated, the Chesapeake and Ohio Railway's Financial Bureau exists to supply the kind of data that will keep the road's rolling stock rolling. Or to put it in stuffer economic terms, the purpose of the computer equipped Cleveland office is to develop the information needed to keep the cycle of money to product (or service) to money at all times functioning at a healthy pace.

Broken down, the Bureau's objectives are to maintain the financial strength of the nation's seventh largest railroad at a level sufficient to support stability, growth and the dividend rate; to enable the company to meet debt commitments with enough cash left over in combination with depreciation to finance a reasonable portion of capital expenditure by its own means; and to keep the plant operating on a continuing basis to render outstand-

ing service with the proper capacity kept in modern condition.

Every day at noon the Bureau issues a report of the revenues derived from the previous day's operations. This daily financial rundown is compiled from information gathered throughout the system by the largest commercial leased Teletype network in the world—25,000 miles of circuitry. This information is processed by Univac, for only computer processing is fast enough to permit the data to be of actual value to the company's planners.

Short-term Investments

Because of the ability to speedily produce daily cash forecasts along with the daily revenue reports, C & O is better able than ever before to predict its necessary cash position from day to day. This means that the company's investment men are able to take advantage of short-term investments on a basis insuring the highest possible return. Such an ability to put idle funds to work at the proper time and in the most profitable manner can result in several million dollars in added income for a major corporation over the period of a year.

Accurate long-range economic forecasts by the Bureau's four plan-

ners keep the railroad out of financial trouble. With the help of its computer system, the planners are able to project figures and forecast freight volume trends, necessary maintenance programs and a host of other developments relative to the company's operations.

In preparing monthly, five and 10-year forecasts, the Bureau calls on outside as well as internal reportorial sources. For example, coal is among the most important commodities hauled by the road. Consequently, the health of the coal industry must be kept under close scrutiny. Information obtained from coal industry agencies is projected into coal car needs and the revenue which may be expected from this source in the future.

Prepared for Recession

The value of scientifically arrived at long-range forecasts is perhaps most dramatically underlined by incidents arising out of the 1958 recession. The C & O computer system predicted the dip far enough in advance to enable the company to brace itself for the downturn. It is estimated that two abrupt changes of direction recommended by the Bureau in that period saved the Chesapeake and Ohio \$7 million!



PRIMARY JOB of large-scale Univac system at the Chesapeake and Ohio is to supply data that will keep the railroad's 90,000 freight cars in constant use so that the capital investment will make an adequate profit.

Medical Claims Shrink to Microfilm Size

Connecticut Medical Service serves members better with Microtaped claims records.

by E.R. WHITTAKER

Assistant Director, Claims and Physician Relations
Connecticut Medical Service, Inc.

Hundreds of thousands of client claims are processed annually by our organization. In 1959 alone the total exceeded over 280,000. In addition to these, hundreds of thousands more are filed away for future reference. Getting at them quickly and efficiently when they are needed is being simplified for us by an efficient filing system that combines the advantages of standard filing procedures and unitized Microtape.

Basically, the system works this way. A claim comes in and is assigned a claim number. It receives an initial screening and goes to CMS' tabulating department where an "arising", or inventory, card is made. The patient's name, date of service, claim number and other data are key punched into the card for control and audit purposes.

After (and if) a claim is approved a complete key punch card is prepared which contains all statistical data regarding the claim—amount paid, procedure code assigned, date paid, patient's name, etc. It is used to draw the check for payment and is later used for statistical and analytical purposes. The card goes to the Claims Service Department where the actual claims are filed in stand-up files by date paid and claim number order. The punch card is filed alphabetically in rotary automatic filing equipment. This file is invaluable in checking the previous claim history and for duplicate claims.

Both the claim and punch cards are used for research purposes and remain filed for one year. Shortly after the first of the next year, and after they have outlived their immediate usefulness, an IBM alphabetic listing is drawn up of these cards. It is at this point that microfilming plays its vital part in our records system.

The listings are microfilmed by an outside contractor and mounted on index cards in the same order that they appeared in the files. After mounting, they are filed in the same order as were the paid claim cards. We use this as an index; many times information that we need can be obtained directly from the microfilmed listing since it contains the same information as the cards.

Next we go to the claims themselves. They are sent out to the microfilm service organization (in our case, Amer-

continued on page 46



LISTINGS are microfilmed by an outside contractor and mounted on index cards for easy reference.



KEYPUNCH CARDS containing statistical data are kept in stand-up files for one year.



POCKET READER is used by all the CMS staff to refer to Microtaped claims.

Secret weapon of the Signal Corps is storage setup where blueprints are miniaturized, then stored in automated trays for ready access.



PORTION of Simplafind operation at Ft. Monmouth. Nearby are readers for quick reference.

Signal Corps Mechanizes Drawings Retrieval

Developing an information routing system is important to the proper functioning of any data center. However, filing this information at the point where it originates is just as vital. A prime example of a well-integrated filing operation is the one found at the U.S. Army Signal Corps installation in Ft. Monmouth, N.J.

Every day men at Monmouth are making contributions in the guided missile, jet, satellite, electronics and radar fields. The huge areas of technology which comprise this Signal Corps mission involve the production and filing of vast quantities of microfilmed engineering drawings, related procurement data and tabulations.

In charge of these 525,000 docu-

ments is the U.S. Army Signal Equipment Support Agency. Vast areas of files and a staggering bulk of essential blueprints have been reduced to a comfortable physical size and made speedily available in automatic push button filing machines.

Formerly, copies of drawings were supplied by making full-scale duplicates and shipping them to the Signal Corps suppliers and depots. This was a tedious process and required many man hours to pull the drawings and reproduce them. The Corps decided that one solution to its problem lay in reducing these documents to unitized microfilm.

The completed project called for either 16 or 18 sets of cards with duplicate 35mm film images of all documents. Two of these were posi-

tive images, and the rest negative.

Installations around the world often receive more than one set of drawings. A filing coding system was devised to prevent misfiling and intermixing of cards in those operations which handle more than one set. Four styles of cards were evolved — one plain and the other three with different colored stripes. The stripes were positioned in different zones on the cards as an aid to color-blind personnel.

A master set of cards was punched with the description and numbers of each drawing, specification or parts list. This information was obtained by viewing the images on film readers.

The cards were then run through an interpreter which printed the previously punched data across the top of each card. Each master card was then verified by double-checking it against the film image.

The master cards were run through a reproducing punch to produce all the punched aperture cards necessary. Finally the 35mm microfilm was mounted into its proper punched card.

Now the Corps was faced with lots of aperture cards but no place to file them. For storage in the least possible amount of space and for speedy retrieval USASESA chose

EASY TO REACH trays in filing cabinets make aperture cards instantly accessible.



the Simplafind, a product of Wheel-dex and Simpla.

With this equipment the cards are filed in easy-to-reach trays riding in cradles, any one of which is delivered to the operator by simply pushing a button. The machine determines the direction of rotation, forward or reverse, for the shortest distance to the cradle or section desired.

The Simplafind apparatus is now housed in space formerly required for just one section of the drawing file cabinets. Giant readers are placed adjacent to the machines so that when a card has been delivered from the file it can be duplicated promptly. ☐

MICROFILM TOPICS

continued from page 11

tenuous path between legality and illegality. Whenever they are asked to reproduce material that is copyrighted, they must decide if this photocopying is done under the "fair use" provision of the law. This problem has been under consideration since the early days of microfilming, and at present is the subject for the Joint Library Committee on Fair Use in Photocopying, under the chairmanship of Edward G. Freehafer of the New York Public Library.

Two problems face prospective purchasers of microfilm from libraries holding the materials that they want. The first is whether the institution has a microfilming service, and the other is what type of order form they should use to procure this service. In 1959 the A. L. A. published a *Directory of Institutional Photoduplication Services in the United States*, compiled by Cosby Brinkley of the University of Chicago. A new and enlarged edition of this directory is being considered at the moment. A Standardized Photographic Order Form Committee, under the chairmanship of the author of this column, is working on a form which should make it easier to order photocopies and simpler to fill and file these orders. ☐

Now Available!

The DOCUMAT

MICROFILM

READER-PRINTER



**Automatically
makes
black-and-white
enlargements from
microfilm in
room light**

It's a Better Printer because the silver process makes better copies—even from poor film—sharp, clear black-on-white.

It's a Better Reader with a full 11"x11" viewing screen for faster finding as well as viewing.

Now it's more convenient to make microfilm enlargements right in your office, just as easy as using a photocopier. Just push the button, and the reader-printer automatically delivers cut letter-size sheets with film enlargement uniformly framed. Takes either roll or flat film.

ATTENTION DEALERS: Additional distributors are now being appointed.

Write for complete information on the Documat Microfilm Reader-Printer—Now ready for immediate delivery!

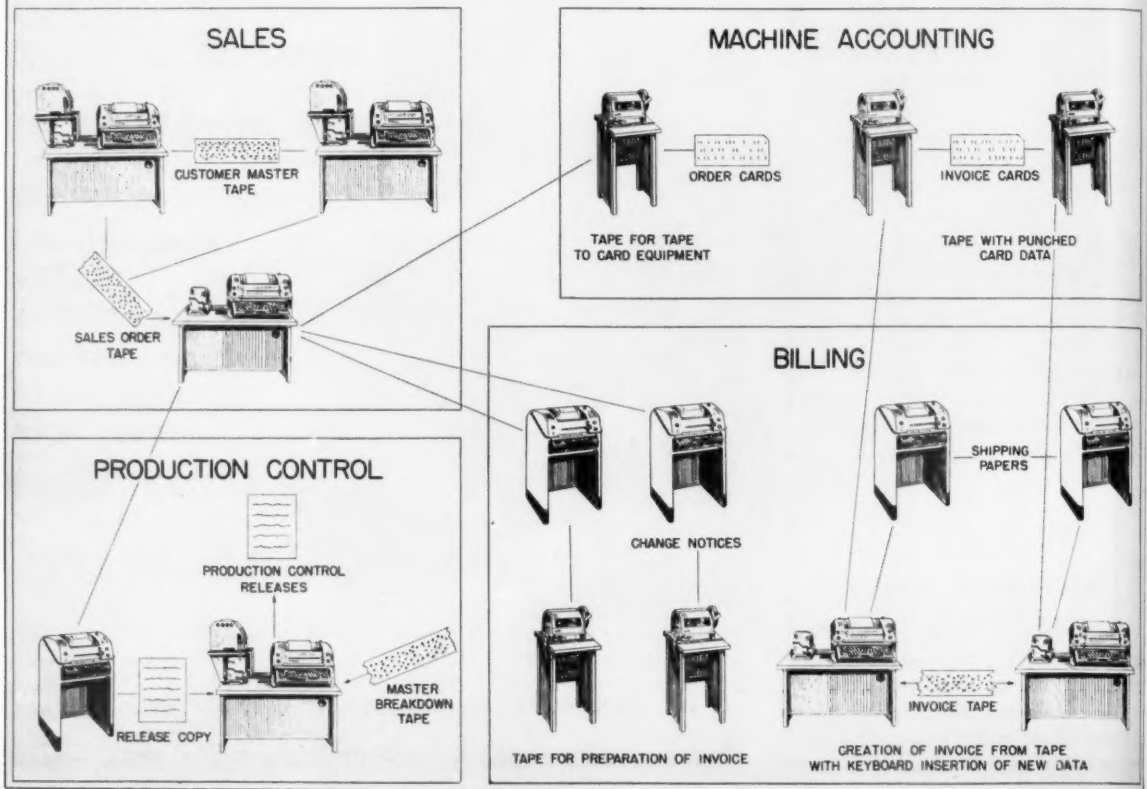
DOCUMAT, INC.

385 CONCORD AVENUE, BELMONT 78, MASS.

Circle No. 504 on Post Card

AEROQUIP CORPORATION

I.D.P. ORDER BILLING



Tomorrow's Orders Filled Today

This is almost the case at Aeroquip, maker of heavy equipment, where combining Teletypewriters with punched tape has speeded up processing rush orders from government contractors.

by **LLOYD HERNDON**
DON GERIGHTY
Aeroquip Corporation



AUTHORS: Herndon (L) and Gerighty discuss flow chart for orders.

One day recently a giant C-119 from Hanscom Field, Massachusetts landed at Jackson, Michigan. Air Force men hurried to Aeroquip's Jackson plant, picked up two boxes of hydraulic hose assemblies, loaded them on the plane and sped the urgently needed cargo back to the Cambridge Research Center in Massachusetts.

Although not all orders are filled as dramatically, this incident illustrates Aeroquip's need to handle orders with speed and efficiency. It is around this requirement for providing quality service to customers that our firm has built a data processing system which integrates orders, production, inventory control and billing.

Before working out the IDP system with the Standard Register Company a multitude of order copies were hand-carried to the various offices of the company. Production control forms were manually typed, inevitably leading to inaccuracies. Aeroquip's new IDP system blends punched tape, Teletypewriters, punched cards and an IBM Ramac 305 computer. Information used in producing one document is saved in punched form and re-used to produce the others necessary.

The Jackson sales office receives about 1400 orders a month — up nearly 500 over the previous year. For each order our clerks pull a master tape containing the customer's name and address, shipping address, customer codes, etc.

Using this tape and the Teletypewriter keyboard an operator cuts a sales order tape. Information she keys in includes customer's order number, date, our order number, routing requested, parts ordered and their quantity.

This tape is then placed onto a Teletypewriter transmitter attached to a page printer. As it is run, it prints a Standard Register four-part Kant-Slip continuous order acknowledgment form and transmits the sales order information via our internal Teletypewriter circuits to our production control, machine accounting and order billing departments.

continued on page 45



AFTER ORDER'S ARRIVAL Teletypewriter operator uses pre-punched master customer tape to produce sales order tape.



SALES ORDER TAPE (L) is then transmitted to production control. Tape is put through converter to produce invoice cards (R).



ORDER COPIES and tapes from the original sales order tape transmission are received in the billing department. They will be filed by work order number until the product is shipped.

Teletype Network Speeds Brokerage Bills Along Their Way

A nine-square-foot converter at Merrill Lynch, Pierce, Fenner & Smith smoothly transforms magnetic tape to teletype tape; thus allows billing on day of transaction.

The nature of its business calls for the stock brokerage firm of Merrill Lynch, Pierce, Fenner & Smith to bill its 130 far-flung offices on the same day that transactions take place.

For this purpose, Merrill Lynch utilizes an IBM 705 computer on which approximately 16,000 daily transactions are figured and transcribed onto magnetic tape reels.

Before the Digitronics Converter made its appearance, however, the operation bogged down at this point.

The information had to be converted from magnetic tape into punched cards. Then the information had to be converted to five-hole paper tape. Using an '063' card-to-tape machine, this was done at the rate of seven cards per minute (each card represented one local bill).

7:30 P.M. Closing

With an urgent need to transmit the information to all branch offices daily, and as quickly as possible after the exchanges closed, eight part-time clerks were used for six hours daily. They had to sort each delivery of cards by office and wire circuit, load and unload the 16 IBM '063' machines, and distribute the perforated tapes to the wire circuits. About 300 square feet of floor space were required to accommodate men and machines, and the day's work wasn't finished until about 7:30 every evening.

Merrill Lynch wanted to streamline this operation. They approached the Digitronics Corporation of Al-

bertson, N.Y., pioneers in data processing technology with a reputation for solid state converters.

Digitronics' answer to Merrill Lynch's problem was a converter occupying only nine square feet, which converts magnetic 705 tape directly to teletype paper tape at the rate of 240 characters per second, or 2,400 words per minute. In a test, out of a total of 1,700,000 characters, *not one error occurred.*

Transactions Converted

In one run, over 19,000 transactions, computed in 68 minutes, were converted from magnetic tape directly to teletype local billing tape in two hours and five minutes. The converter handles 150 local bills per minute.

Now local billings are received from 30 to 45 minutes earlier each day than in the days before the converter. Floor space requirements have been reduced from 300 square feet to 30 square feet. Eliminating the punched-card step saves three hours daily; card sorting and possible misfiling have been eliminated; the 16 '063' machines, with a rental of \$1,600 per month, have been eliminated; passes through the 705 computer have been reduced from 7 to 5 times daily. The man hours required to perform this operation have been reduced from 48 to 12. Most important, perhaps, the cost of the operation has been reduced \$6,800 monthly, \$81,600 annually.

Are Merrill Lynch, Pierce, Fenner & Smith satisfied? Well, they've just ordered another converter. □



ENGINEER BERNARD STOLZMAN inspects one "card" of the transistorized printed circuit system.



JOHN ANDERSON (R) and teletype operator Frank Campbell examine local billing tape.

Reproduction record problems too

BIG

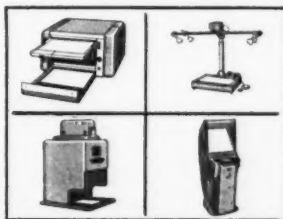
to handle?

CUT THEM DOWN TO
SIZE WITH
REMINGTON RAND
MICROFILM



Remington Rand Microfilm cameras and equipment give fast, efficient solution to record storage, protection and copying!

Prove to yourself how Remington Rand microfilming can solve space, storage and copying problems as well as help you devise new office techniques and systems. Even more important, Remington Rand microfilm experts are always available to you to *diagnose* record problems—help you train personnel in modern microfilm techniques.



Learn all the advantages of Remington Rand Cameras—the best of the portables and stationaries—and all the supplementary equipment and services that go with them . . . see what they can do for your particular business operation. Get all the information on the complete microfilm line—Remington Rand! Use attached card now. No obligation, of course.

Remington Rand Systems

DIVISION OF SPERRY RAND CORPORATION
122 East 42 Street, New York 17, N. Y.

Circle No. 515 on Post Card



HARVEY MC MAINS OF AT&T shows cut-away model of Data-Phone.

They Make The Wires Hum

Far-flung "talking" business machines at Hardware Mutuals will soon transmit data by phone; thus stepping-up service to policyholders.

Within the near future, business machines "talking" to each other across thousands of miles will enable the Hardware Mutuals-Sentry Life insurance group to reduce its operating costs by more than a million dollars annually, yet at the same time improve its service to its policyholders.

The machines will "talk" to each other by Data-Phone. Data-Phone links different locations together over regular telephone lines. Connections are put through as simple telephone calls. Data-Phone converts the signals from business machines into a form which can be sent over the telephone network. Even the largest, high-speed business machines can exchange information in this way.

The Hardware Mutuals-Sentry Life insurance group installation will be the largest to date. Data-Phone sets will speed the transmission of data from the company's 36 widespread branch offices to its new data processing center in Stevens Point, Wisconsin.

New applications for insurance will be transmitted to Stevens Point instantaneously in punched card form. The punched cards will be fed into an advanced IBM 7070-1401 transistorized electronic computer system. The computer will verify rates and issue new policies overnight. Similar Data-Phone transmissions of punched card information will also renew policies, change addresses, report new car purchases and record premium payments.

Policies Updated

The electronic computer will produce every form of policy record and notice from a single punched card source, reducing the margin for manual copying errors. Every insurance policy record will be brought up to date every 24 hours. Address changes, car changes, coverage changes and latest premium payments will be reflected immediately in renewal notices, premium collection notices and other communications, minimizing opportunities for misunderstanding between

the insurance companies and their policyholders.

Electronic automation of paperwork operations has been under continuous development at Hardware Mutuals for more than five years.

An IBM 650 computer with punched card input-output was

POLICY CHANGES are transmitted in punched card form over regular telephone lines.



leased first for statistical work but was soon applied experimentally to every possible form of paperwork. In the fall of 1957, the computer contributed to overcoming bottlenecks in rating and issuing 48,000 Massachusetts compulsory auto policies, with a total of \$6,000,000 in annual premiums all effective on New Year's Day. The operation was so successful that the companies were writing more than \$30,000,000 in auto insurance policies of various forms by punched card methods by the end of 1959.



PUNCHED CARDS containing information on policy applications are duplicated instantly by an IBM Transceiver operated by electric impulses from Data-Phone.

Early in 1960 the companies launched two strategic ventures with all procedures geared to electronic data processing systems.

More Automation

Sentry Life Insurance Company, a wholly owned subsidiary, planned all of its operations for machine methods. Sentry Auto Policy, a new independent private personal auto policy form was introduced state by state, with data processing savings figured into low independent rates. Plans were developed for shifting private fire and homeowners policies to machine methods when delivery of the new 7070 computer permits handling the rapidly growing load.

The companies also have gradually transferred general payroll, claims payments and salesmen's payroll and commissions to machine methods. □

On the Record

Unusual Systems Applications and Ideas Around the World.

● **Computers in the Classroom.** A computer-operated teaching system with the ability to tailor its instructions to an individual student's talent was shown recently at the Eastern Joint Computer Conference. Heart of the system is a Bendix G-15 electronic computer, programmed to sense a student's needs, respond to his errors and build up his knowledge and confidence . . . Because a calculating machine flipped its digits 12 Kent State University undergrads are back in classes after being flunked. Dismissal notices were sent to 560 students. Some couldn't believe they had failed, checked with their deans and were reinstated. Grades are now being recalculated.

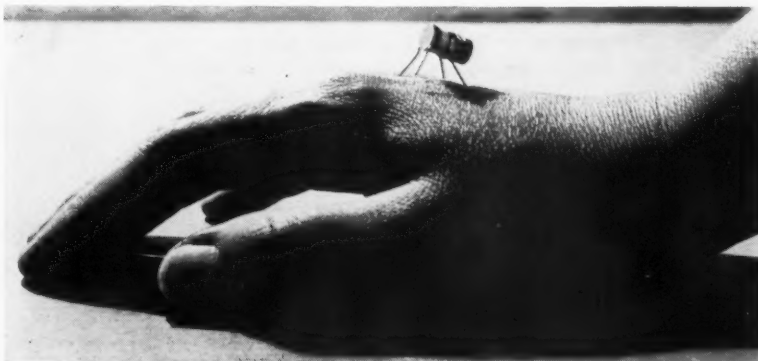
● **Luther on Microfilm.** Ernest G. Schwiebert, director of the Institute for Reformation Research, is now microfilming writings by Martin Luther and other Reformation authors. Security rolls are being stored in an underground depot in the Rocky Mountains.

● **Automation 'Round the World.** Across our desk trickles news of automation developments abroad.

An order for a Univac II computer, the first ever received from Japan, is near completion at Rem Rand's Philadelphia plant. Purchaser is the Tokyo Electric Power Co. . . Handling time on mail orders will be cut in half with the new IBM 7070 system installed at Germany's Necker-mann Versand KG, one of Europe's largest mail order houses. . . The first independent commercial computing center in Britain will be operated by the British subsidiary of C-E-I-R, Inc. in London. An IBM installation, the center is for use by government and commercial clients in Britain and Western Europe.

● **Hardly an office exists that does not have alphabetical filing.** However, the filing rules in each office are as different as the people who use them, according to Mrs. Ida Welch, American Records Management Association.

Her organization has set up 50 rules covering recurring situations that arise in alphabetical filing. An illustrated publication giving these rules may be obtained for \$4 from ARMA President William Benedon, Lockheed Aircraft Co., P.O. Box 551, Burbank, Calif.



DON'T SWAT! This insect is actually a precision air capacitor, made by Johanson Mfg. Corp. Even though extremely small — less than one-half inch long — the device is fully adjustable over a 10:1 range. It is primarily used in computers and other electronic devices requiring fine tuning.

Kaiser Aluminum contractors supply drawings in all shapes and sizes for microfilming. To prevent bedlam the company uses this filing system.

Playing The Numbers Game

Microfilm's value as an engineering tool has become as obvious as its archival benefits at the Ravenswood, W. Va., works of the Kaiser Aluminum & Chemical Corporation.

Administrative Engineer J. W. Patterson, who set up the Works' microfilm system for solving blueprint function problems, puts it this way: "Microfilming has overcome the problems of classification, coding, indexing, standardization and constant revision of engineering drawings. The cost of the entire microfilming program is more than taken care of by eliminating the cost of purchasing flat files alone."

Engineering drawings at the Ravenswood Works are of two types — those originated by Kaiser's design department and those detailed drawings furnished by the hundreds of different companies providing various pieces of equipment.

The heavy volume of drawings have as wide a size spread as 8½" x 11" to 48" x 114". One of the 14 rolling mills presently in operation or being installed may include as many as 5,000 drawings from 40 different firms.

A further complication is the requirement that three separate sets of files be maintained. These are coupled with the problems of accurate charge-out and the effort to issue only the latest revision.

The drawings are microfilmed after being properly identified, classified and indexed. The identi-

fication is stamped on a label attached to the drawing and becomes an integral part of the drawing.

A file number consists of a letter and four numerical components — R-000-00-000-00. The letter signifies the plant. The first group of numbers is the cost center; the second indicates the number of pieces of equipment in that cost center.

The next group of three numbers is designated the "component number" and is assembled in blocks of 10 figures in the order of the flow of material through the equipment. Each piece of equipment is broken into assemblies and sub-assemblies, depending on the complexity of the unit.

The "component number" also indicates the trade involved — i. e., electrical, hydraulic, mechanical. For example, all electrical prints are coded in the 500 series, and all schematics are in the 510 series.

Thus, if an electrical maintenance man needs a schematic of a unit on which he is working, the plate on the equipment tells him where to look in the files, and the folder marked 510 shows him all the schematics for that unit.

The last two digits refer to an index detailing all the prints on file with a vendor's number. The digits indicate the number of prints in the particular component and are assigned in numerical order.

Through microfilming under Patterson's setup, the filing system

FILMSORT SURVEYOR used to study drawings.



places the prints of one piece of equipment in proximity to the equipment related to it.

Prints also are filed in accordance with the flow of material through the plant. Each machine or section of machine is filed in direct relation to the processes before and after, regardless of the type or size of the print.

Filed are the original microfilm, two duplicate negatives mounted in aperture cards and standardized 11" x 17" Xerox reprints for reference files.

Incorporated in the files are the cost center numbers used by the accounting department in coding the machine or process. Files, therefore, are available on a 24-hour basis, even though clerical help is on an eight-hour day because personnel requiring information from the files generally know the cost center number involved.

Uniformity of size is obtained by assuming the prints will fill an 11" x 17" area when enlarged, or in the case of a reduction that it will fill the frame when reproduced on 11" x 17" paper.

Relying on an outside vendor for processing, the program requires high-enough quality to enable enlargement of the film back to full size on cloth or film for later revision.

Patterson reports that they are getting acceptable results daily with 35mm film. Their maximum print-size limitation has been established at 34" x 44". The one per cent of their prints exceeding this size are filmed in sections and full-sized reproducible are kept on file.

The film is reproduced on 11" x 17" vellum by means of a continuous Xerox printer. The reproductions are then stored in Hamilton upright jumbo file cabinets, and the problem of size is solved.

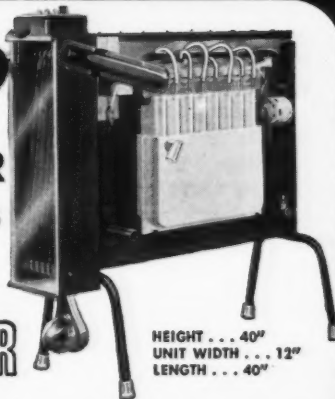
With the identification label on the print is a six-inch rule. It facilitates enlarging to full size in the darkroom, and when referring to reduced Xerox prints is helpful in adjusting to the scale.

All reference work is from Xerox copies. When an engineer wants a print, the Xerox copy on vellum is

continued on page 46

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MILSCO MANUFACTURING COMPANY
2758 North 33rd Street, Dept. 25, Milwaukee 45, Wisconsin

Terminate Search Problems

Here's one company's patented answer to records retrieval, a difficult problem that must be overcome when setting up an information system.

The editors have received a number of queries pertaining to the Termatrex Information Search System: What is it? How does it work? Is it compatible with microfilm and other visible storage systems? To answer these questions we called on Jonker Business Machines, Inc., originators of Termatrex. The following resume of the system is based on information supplied by the company.

Record retrieval is one of the most difficult problems to be overcome in information systems management. The problem is not of finding a document by its serial number, a relatively simple job, but of finding all documents pertaining to a specific question.

The Termatrex system of document searching attacks this problem from a modular or building block approach. This entails complete physical separation of the search system and document storage. As a result, either can be added to as the need arises. Increases in search-speed, capacity, versatility, etc. can be effected by adding other components.

Basically the system (as illustrated in Fig. 1) comprises a number of cards, each dedicated to a "term" or key concept. For example, Fig. 1 shows three cards dedicated to the terms "Analog," "Digital" and "Computer."

Each card has an area dedicated to a document in the information collection. To enter a document into the system, the serial number of the document is punched into each card corresponding to the terms by which the document has been indexed. In Fig. 1 it can be seen that the card "Computer" shows that Documents No. 3, 6, 10 and 13 have been indexed by the term "Computer"; the card "Analog" shows that Documents No. 3

and 13 have also been indexed by the term "Analog."

A search by combinations of terms is made by mechanically superimposing the corresponding cards and looking for coinciding holes. For example, superimposing the cards "Analog" and "Computer" show that Documents No. 3 and 13 deal with analog computers. Superimposing the cards "Digital" and "Computer" shows that Documents No. 6 and 10 deal with digital computers.

Thus, the Termatrex system represents the opposite of conventional punched card or edge notched card systems. In these latter systems there is generally

a card for each document and the "terms" describing the document are punched on the card or along its edge. Termatrex, however, has a card for each "term" and the serial numbers of the document have been punched out on the cards.

To enter a document the cards corresponding to the index terms of the document are placed in superimposition in a Termatrex machine and a hole is punched or drilled at the hole number corresponding to the serial number of the document. The numbering system of the positions is a simple x-y coordinate system; the numbers can be read off by means of one fixed scale (y-axis) and one movable scale (x-axis).

For search, cards corresponding to the search terms are superimposed in the machine. A template with the scales is placed on top and a light in the base of the machine is turned on. Coinciding holes in the cards show up as light dots and serial numbers can be read off by means of the two scales.

A document can be cancelled by drilling a hole at the position of the item in a green translucent "cancellation card." This card is included with the search cards so that green light dots designate active items and white ones designate cancelled items.

Different models of Termatrex machines fulfill different information storage-retrieval system needs. Template models with hand drills have small card capacities. Track models offer greater item storage capacity on cards and the ability to duplicate large numbers of cards easily.

Key features of all models of the Termatrex machines — from simple template models for office use to large, automatic track models for engineering data control — all feature low input cost, inexpensive dup-

continued on page 46

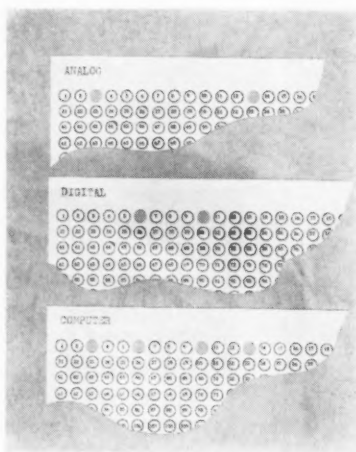


FIG. 1

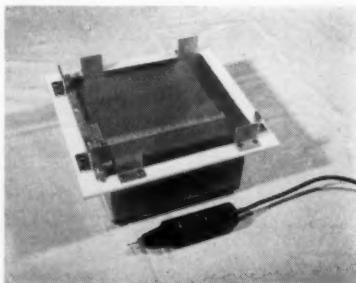


FIG. 2

fore taxes and 22% on capital investment.

(4) Development and adoption of Yardsticks for measuring, reporting and evaluating performance in the light of predetermined objectives. Yardsticks are culled from the objectives and reflect the end results of the expenditure of time, effort and money. Examples of yardsticks related to the objectives stated in Point 3 above would include: Percentage of annual growth, dollar amount of annual increase in sales, dollar amount of annual increase in net worth, percentage of net profit on sales before taxes and on capital investment.

(5) Establishment and clarification of Policies for the enterprise as a whole, for each component and for each budgeted program.

(6) Review and evaluation of the plan of Organization to determine its adequacy for achieving program objectives. The plan of organization will directly affect the design of the management information system in many respects. For example, the span of control, the extent of centralization or decentralization, and policies governing accountability and delegation will be significant factors in the establishment of control points and in the content, frequency and flow of management reports.

(7) Review and evaluation of Systems and Procedures to determine their adequacy for meeting program objectives and for generating the data and information indicated by the yardsticks.

(8) Periodic Reporting of accomplishments in terms of the stated objectives and predetermined yardsticks.

(9) Review and Evaluation of reports, analysis of variances from goals, identification of areas of possible improvements, and determination of action required.

(10) Follow up to effectuate necessary improvements, revise objectives, etc. The basic principle is that Action is the paramount reason for reporting — data and information are by-products. □

EDP in Action

by MURRAY FREIDBERG
Tabulating And Business Services, Inc.



How to Get the Most Out of Your Service Bureau

Few business managers like to use service bureaus. But they have to face the fact that seasonal peaks present no other choice. It would be bad business to staff and equip a department to handle the heavy load and then have men and machines operating at less than 50% of their capacity the rest of the time.

Steps to Success

Once you have resigned yourself to the fact that you must use a service bureau, the thing to do is concentrate upon getting the most from yours.

Here, then, are a few ways of cutting your service bureau bill and assuring the high quality that you have a right to expect:

Schedule

1. Schedule your outside work as far in advance as possible. This will give you time to select the most suitable agency. Try to visit the company before assigning them the work. Determine their limitations. They may not be able to physically handle the work load in the time allotted. Confer with your service bureau salesman. He may have a few tricks up his sleeve that will save you steps, ergo, money. He wants your job; make him work for it.

Supply

2. Supply your service bureau with detailed procedures wherever possible. Not only will this avoid misunderstanding, but time spent on methods writing by the service bureau is generally added into your bill.

Provide

3. Can you provide any pre-wired panels? Most bureaus are well-staffed with wiring "Aces," but you're paying for their time. If it's a job you would normally do, but

now you're overloaded, send your panels along.

4. Have you edited your key-punching source? Each phone call caused by illegible hand-writing, impossible or missing codes, etc., simply adds to the time building up on the "cost sheet" with your name on it.

5. On lengthy runs, have you seen a sample? It would be a pity to have to pay for a re-run because you forgot to specify a credit "X".

6. Are there any control totals, card counts, etc., that you can provide? The machines and personnel at a service bureau are subject to the same failings as your own. But if you *do* provide a control, be sure it is exact. Lots of time (that you are paying for) can be consumed trying to balance to controls that are incorrect.

Up-Date

7. Are your master files up-to-date or will you be paying a service bureau to reconcile your "unmatched conditions"?

8. Whenever possible, supply your own clerical help for editing, coding, balancing, etc. These are operations that a bureau performs well but not inexpensively.

9. Select your service bureau realistically: that is, shop around but base your choice on both price and quality.

10. Insist on written time and cost estimates. You can expect to be charged for additions or modifications to your procedure, which is another strong argument for thorough pre-planning.

The Consequences

Careful planning, judicious selection and diligent control will help you beat your year-end jitters, shrink your bureau budget and maybe even catch your 5:20 commuter's special. □

Yours for the Asking

New free literature on the latest developments in the data processing and microfilming fields. Each item listed has a key number. For more information circle that same number on the Readers Inquiry Card.

Systems

Microfilm Indexing 201

Remington Rand Systems. 12-page booklet describes Microdex, a system of indexing directly on microfilm.

Filing System 202

Microtape Systems. Data on a low cost filing system for business records.

Converter 203

Systematics. Folder describes the C750 universal code tape-to-card conversion system.

Graphic Pictures 204

Graphic Systems. Boardmaster visual control system gives graphic picture of operations in production, traffic, etc.

Micro-Reproduction System 205

Minnesota Mining & Mfg. Co. Folder discusses the standards of the engineering data microreproduction system used by the Department of Defense.

Planning a System 206

Charles Bruning. "Basic Microfilm Indexing and Filing Techniques" tells how to achieve maximum results from a microfilm system.

Business Forms

Systems Card Storage 212

Systems Sales Co. Description of systems card filers and mailing cartons which are economical and efficient.

Marginal Punched Form Binder 213

Yawman & Erbe. Catalog L describes a complete line of binders for holding marginal punched forms.

Computers and Accessories

Data Processing 215

National Cash Register Co. Booklet on integrated and electronic data processing equipment.

Electronic Data Processing 216

Radio Corp. of America. Booklet de-

scribes the 601 electronic data processing system which has ultra-high speed and enormous capacity.

Electronic Computer 217

Burroughs Corp. Literature on the E103, an electronic computer which has the flexibility of accounting machine input and output.

Panel Accessories 218

Tech Panel Co. Brochure on such units as "Piggy Back," Dial Switch and Card Marker.

Desk-sized Computer 219

Control Data Corp. Booklet on the 160, an all-transistorized computer for high speed data processing.

Large Scale System 220

Philco Corp. Data on the Transac S-2000, the only large-scale data processing system utilizing parallel logic and asynchronous operation.

Calculator 221

International Business Machines Corp. Brochure presents a thorough control-panel summary of the low-cost Model B-1 609 transistorized calculator.

Inventory Control 222

Bendix Computer Division. Illustrated application report on how the G-15 Computer helped solve a complex marketing problem.

Microfilm Cards

Aperture Card 226

Microseal Corp. Description of a new aperture card in which the film is protected by a triacetate covering.

Unitization 227

Microcard Corp. Literature tells how microcards make reference data instantly available.

Film, Darkroom Equipment and Materials

Neg/Reversal Processor 234

Filmline Corp. About processor which develops both film types.

Splicer 230

Prestoseal Mfg. Corp. Brochure about

the Presto-Splicer which splices print end-to-end on the frame-line.

Microfilm Printer 231

Riken. Info on how microfilm can be enlarged and printed on A-4 papers by the Ricohfax M4 printer.

Rapid Microfilm Processing 232

Andrews Paper & Chemical Co., Inc. Information about the rapid enlargement and processing of microfilms that is possible with the Rollacopy process.

Mini-Rapid Processors 233

Fairchild Camera & Instrument Co. Booklet describes Fairchild's line with leaderless film delivery.

Printer-Processor 235

Kalvar Corp. Interesting information about the Kalfax Microfilm Printer-Processor.

Mono-Copy Paper 236

Anken Film Co. Data on how positive copies can be made directly from negative microfilm.

Microfilm Processing 237

Houston Fearless Corp. Brochure on the Microfilm Labmaster for microfilm processing.

Microfilm File 238

Cole Steel Equipment. Description of newly designed cabinet containing 14 drawers.

Microfilm Cameras & Readers

Microfilm Reader-Filler 241

NB Jackets Corp. Information about new reader-filler which allows you to view the images as microfilm is unitized.

Portable Microfilmer 244

Recordak. Flyer on the Recordak portable microfilmer with a 20-to-1 reduction ratio.

Microfilm Reader 245

Erban Optical Corp. Details on the 1612-L, a portable reader with a 12" x 16" screen.

Microfilm Reader 246

Taylor-Merchant Corp. Information about compact microfilm reader to read roll film, aperture cards and sheet film.

Camera-Enlarger 247

Dea-graph Equipment Ltd. Data on the CA 7, a 35mm camera-enlarger for all microfilming and reproduction jobs.

Universal Reader 248

Documat, Inc. Description of a microfilm reader for both roll and unitized film.

Microfilming Information 249

The Gevaert Co. of America, Inc. 28 pp. booklet gives valuable information and data about microfilming.

Magazine Camera 250

Photo Devices. Data on the model PD1100, a 35mm microfilm camera with magazine and 100' capacity.

Services

Data Processing Services 254

McDonnell Automation Center. Booklet describes data processing services available from this midwestern firm.

Microfilm Facilities 255

Microdealers. Folder describes nationwide services of this company which include microfilming of engineers drawings, public records, etc.

Miscellaneous

Photostat Photocopiers 257

Photostat Corp. Specifications on Photostat #2 Standard, #2 Special and #4 Standard copiers.

Photocopy Machine 258

Cormac. Information on the new 500 photocopying machine which has one-step operation and cuts time by one-third.

Miniaturization Equipment 259

Keuffel & Esser Co. Information about two dynamic new developments in miniaturization of engineering drawings.

Copier Cabinets 260

Mim-E-O Stencil Files Co. Sheet on a copier cabinet which was designed for any copier requiring additional width.

Data Processing Courses 261

Business Electronics, Inc. Catalog describes electronic data processing courses.

Punch Card Inserter 262

Bell & Howell Phillipsburg Co. Data on inserter which automatically inserts and mails punch cards.

Addressing Machine 263

Scriptomatic. Data on the 10-S, an addressing machine designed to bring automatic list handling and addressing selectivity within reach of everyone.

Automatic Typewriter 264

American Automatic Typewriter. Literature on the Auto-typist, a machine which automatically types any letter or paragraph on the record roll.

Collating Information 265

Thomas Collator Industries, Inc. Information on how you can speed up your collating operation (up to 25,000 sheets per hour) and substantially reduce costs.

NEW PRODUCTS

continued from page 8

Lightweight Calculator 111

A new model of the Bohn Contex Calculator has been announced by the Bohn Duplicator Co. The 10 key machine adds, subtracts, multiplies and divides and weighs just six lbs. High speed in entering figures is accomplished by depressing an actuating bar rather than cranking a handle. Over-all size is 10" x 7" x 3 1/2". Price: \$125.

Paper Shredder 112

The protection of corporate information and other confidential documents which have outlived their usefulness is assured by their complete destruction. Michael Lith Sales Corp. has introduced the Destroyit which shreds these papers into strips 3/32" wide. The unit comes complete with wheeled cabinet and receiving bin and will shred up to 8 bond sheets in one pass. Price: \$225.

Microfilm Reader 113

Titan Enterprises has announced the introduction of the new Titan Microfilm Reader which features a large 18" x 24" viewing screen. Designed for aperture cards or film jackets, the unit uses a cardholder with a double glass platen and permits complete scanning of areas as large as 5" x 8". Optics include a 75mm f/3.5 projection lens for bright and sharp images. An interesting innovation is a file drawer built into the base with space for over 1,500 jackets or cards. Price \$595.

Computer Components 114

Electronic Associates, Inc., is now offering a transistorized, "do-it-yourself" special purpose analog computer that will perform a variety of laboratory, engineering and process control computing tasks. The TR-5 Mounting Unit makes it possible for special purpose analog computers to be assembled easily and without the problems usually associated with such a project. PACE solid state analog computing components simply plug into the TR-5 mounting unit, where they may be interconnected according to the computing function to be performed. The TR-5 mounting unit contains all the controls necessary to operate a 20-amplifier computer. The basic unit will house up to six computing components and a fully-transistorized power supply. It may be expanded to large-computer capability by adding up to two expansion units to the basic rack.

Engineering Repro Camera 115

A 35mm planetary engineering and reproduction camera designed to comply with the most exacting specifications for quality of image has been introduced by Photo Devices Inc. The unit has a film capacity of 100' and features a push button-controlled reduction range of 8 to 30 times. Automatic focus and elevator

stops are also incorporated. Exposure is controlled by an electronic timer in 1/10ths from 0 to 11 seconds. Height of the PD1088 is 8'6". Price: \$6,150.

Improved Computer 116

Bendix Computer Div. has announced a major increase in the speeds of the G-20 computing system. The clock rate has been raised from .7 to 1 megacycle resulting in a 40% increase in processing speed. Other improvements include 6-microsecond full word memory cycle time, 120-column printer running at 1,000 alphanumeric or 1,500 numeric lines per minute, and a new control buffer with increased editing and control features.

Card Marker 117

Among a complete line of new accessories available from Tech Panel Company, Inc. is a card marker for card punch and verifying machines. Attached to the card hopper mechanism cover, it marks cards in one of 20 columnar positions and makes it possible to detect the source of "off punched" cards. More than 20 units can be identified if various colored refills are used. Prices: 1-5, \$10 each; 6-10, \$9.25; 11-up, \$8.75.

Planning Aid 118

Methods Research Corp. has available a display board with magnetic vertically-mounted, two-dimensional models for data processing installation and layout. The Magnetic Control Board can also be adapted to planning new buildings and facilities, renovating plans for new offices and buildings and for controlling maintenance operations.

Readout Instrument 119

A. B. Dick Co. has developed an electronic inquiry station which will display readable alphanumeric characters after converting them from digital signals provided by a computer, punched cards, paper or magnetic tapes. Called the Videograph Display Console, the unit will permit branch offices to interrogate a central computer for production and inventory information, account balance information in banks and airline arrival and departure times.

Tape Adding Machine 120

A method of making original source data input for data processing in accountancy has been introduced by Monroe Calculating Machine Co., Inc. The Synchro-Monroe Accountant's Program Punch Tape Adding Machine is available in both single and duplex register models. It features automatic repetition of all code information eliminating the need for re-indexing repetitive reference numbers. Five excess codes incorporated also reduce the possibility of obsolescence.

Verifier-Duplicator 121

Talley Register Corp. has introduced
continued on page 47

Computer Car-Checkout

Transducers "tear down" vehicles in maintenance system devised by Army.

The time is fast coming when all the mechanical functions of an automobile can be checked out in the time it now takes to give a car a lube job — and all without tearing it down. As is so often the case these days, a computer is behind this speedup.

The computer, a LIBRATROL-500 digital control computer, has been put to this task by a research team at the Army's Frankford Arsenal in Philadelphia. An on-line control computer with an input rate of 75 data words of 31-bit length per second, this General Precision product has been modified to accept magnetic tape input.

Included in the checkout system are a voltage-to-digital converter for translating transducer voltage responses into digital form; a commutator unit capable of handling 240 separate transducer lines; a Flexowriter for interrogation, command input and print-out; a magnetic tape storage unit, and accessory equipment for relaying,

filtering, amplifying and switching.

The technique for the automatic-vehicle checkout system calls for interrogating the vehicle with a number of sensing elements under both static and dynamic conditions, and using logic and computer circuitry to isolate specific mechanical malfunctions.

Formulated mainly on the basis of measurements required to adequately determine vehicle performance, required tests are categorized as follows: power pack tests, main electrical system tests and auxiliary engine-generator system tests. Suspension tests and metal fatigue measurements are also being considered and could be incorporated without changing the basic system.

The computer-controlled checkout equipment can perform extremely detailed mechanical malfunction isolation, since the computer utilizes an interrelation of a number of measurements to diagnose malfunctions. Thus, the computer scientifically duplicates the

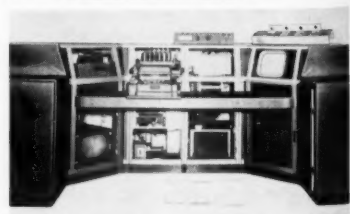
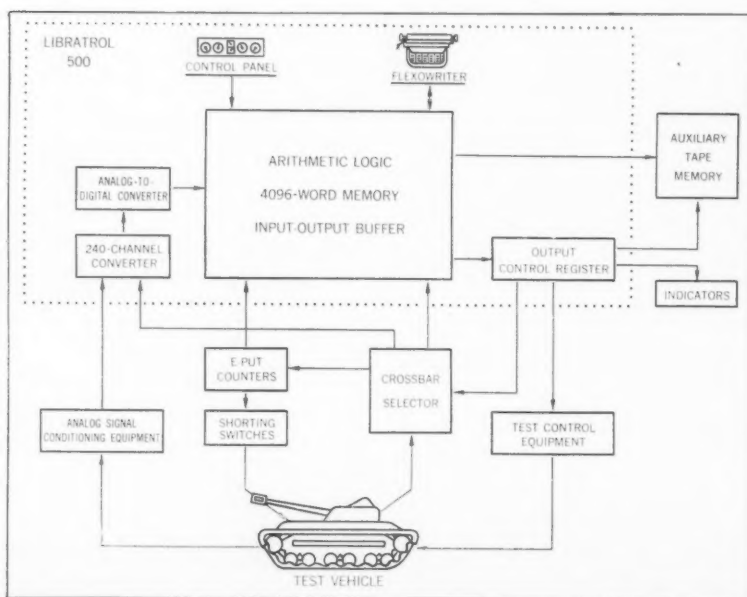
intuitive method employed by the most skilled mechanic.

This interrelation of measurements is preprogrammed into the computer as used in the unit under test. Thus, in effect, the combined experience and skills of the designer and of the best malfunction diagnostician are incorporated into the checkout system performance.

The entire checkout operation is performed with the vehicle's components in their normal operating position and condition. No removal or disassembly is necessary.

Let's follow an actual checkout through to completion.

A vehicle is fitted with sensing elements (transducers) and is then subjected to a static and starting test. If it passes these tests and is capable of operation, it is then loaded on a computer-controlled dynamometer. During the placement of transducers, the console operator calls out the appropriate program from the tape storage unit. The program is automatically load-



FLOW DIAGRAM at left represents Army's system for checking out vehicles like the tank top right. Heart of the system is a LIBRATROL-500 digital control computer (bottom right).

ed onto the LIBRATROL-500's memory drum.

Signals from the transducers are transmitted to the computer, via the commutator and converter, where they are analyzed with respect to the stored program. Responses are stored in "memory" and then dumped through printed output when the test is completed. The result is a complete history of the vehicle, indicating malfunctions, parts to be replaced or repaired and adjustments needed.

The system is capable of completely automatic self-checking. Each time the checkout system spots a malfunction, it automatically bypasses the transducers and substitutes the known measurement (programmed in via the commutator and converter) as a check on the control equipment itself. Thus, when malfunction data are read into the computer and stored in memory, there is no doubt as to their accuracy.

As a further indication of the automatic checkout system's versatility, "bookkeeping" information can be stored on the drum to report the number of vehicles tested, number of malfunctions by specific title, etc. Punched card output could be added for creation of actual work orders after checkout is completed. Output could also be used as input for a computerized inventory control system.

The results obtained through use of this system, correlated with records of failure and operational data on laboratory-controlled life tests, would provide data required to construct longevity tables for any particular vehicle or power unit. Coupled with tables of combinations of components through which alternate paths of measurement will allow elimination of all but the faulty part, these data would, when stored in a computer or controlled system, indicate whether the vehicle under test is satisfactory for a certain elapsed time or that a certain part or parts are faulty and must be replaced. After the computer life-prediction time for the most severe operational conditions had elapsed, the vehicle would be returned for tests and a new prediction. ☐

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concentrate on reducing print costs without taking into consideration the time lost by people who have to wait for desired reference materials.

For our standard drawings, we maintain a stock file of prints made by offset through the xerographic process. Such stock is filed in self-service bins. They are expendable. With self-service bins, people get their prints without delays.

Microfilm's Role

How does microfilm fit into this print service picture? At present, we are not ready to substitute microfilm for initial print distribution. We like the idea of making prints from aperture cards and would like to have a unit to produce 12" x 18" offset masters from microfilm on a medium production basis.

With our present level of new and changed drawings and our present facilities, we cannot supply from film the initial distribution on rush releases if we have to wait for both film processing and card mounting. Our initial releases, even in the future, will probably be made from offset of the original drawings or white prints. After the initial distribution, we have microfilm as an alternative method of reproduction.

In our operations, all new and revised drawings released by the various engineering and development groups go to a control station in the reproduction department, where they are grouped by size for microfilming. With very little delay, the originals are filmed and then forwarded to the print centers.

We have two frames of film for each drawing. We do not list or hand index. The Filmsort aperture cards and film rolls go to our Data Processing Department for indexing. The cards are punched in their film sequence. The deck is also verified.

We find that we can get two decks of cards punched and interpreted for about one-fourth the cost of hand indexing. The cards and film are forwarded to our mounter operator, who verifies each tenth card to ensure film and card sequence. □

Dye-Back vs. Non Dye-Back

A comparison of the two types of microfilm.

by Ernest P. Taubes

One of the important specifications of Department of Defense Document MIL-M-9868, "35mm Requirements for Microfilming of Engineering Drawings," specifies that only dye-back film shall be used for that purpose. The question whether dye-back film has any advantages over non dye-back film has been the subject of considerable controversy in and out of government for a number of years.

Recently, a comprehensive set of experiments was conducted to determine by test whether any advantages are inherent in either of the two film types. These experiments were tailored on similar experiments conducted by the government.

Test Specifications Set

The following test specifications were established:

1. Four different types of microfilm were used.
2. The same camera was used with each type of film.
3. The same document was photographed on each type of film.
4. Each film was processed according to manufacturer's instructions.
5. Each film was examined for resolution and readability on a 60 power microscope. The average reading for resolution was established for each type of film.
6. Each roll of film was cut up into individual images and inserted into aperture cards.
7. The aperture cards were intermixed with every type of film used.
8. The aperture cards were loaded into a Xerox Copyflo machine.
9. The Copyflo machine was set to an average exposure value.
10. A set of enlargements were produced in the Copyflo machine from the intermixed deck of cards.
11. The enlargements were examined by experienced draftsmen to determine whether any differences could be detected between prints and to see whether a Copyflo ma-

chine would produce better enlargements from one type of film than from another. Another aim was to find whether a different setting was required for best results for one type of film compared to another.

One of the specifications on the four different types of film, two dye-back and two non dye-back, was that the inherent resolution specified by the manufacturer was approximately equal in every instance.

The following results were obtained:

1. The average resolution of the best film compared with the average resolution of the worst film varied a total of three points. If the best film read 128 lines per millimeter, the worst one read 125 lines per millimeter as an average.
2. No differences were apparent as to camera operation, exposure time on the camera, processing, inspection, colating, trimming and mounting.
3. The results obtained from the Xerox Copyflo were uniform to the extent that none of the experienced draftsmen could distinguish one print from another and classify it as being produced from either dye-back or non dye-back film. This was with the machine at an average setting, no adjustment during printing operations and a completely mixed deck of cards. Similar results were obtained in a DOD test.

In Summation

The following conclusions are apparent:

1. There is no advantage of dye-back film over non dye-back film in normal operations.
2. There is no advantage of dye-back film over non dye-back film in obtaining better resolution.
3. There is no advantage of dye-back film over non dye-back film in producing prints in a Copyflo machine.
4. Dye-back and non dye-back images can be freely intermixed and printed at the same setting in the Copyflo machine with no apparent difference in quality results. □

AEROQUIP

continued from page 31



In production control a program box hooked to the Teletypewriter selects just the information necessary for that department and the Teletypewriter types it onto a four-part, continuous-form production release. The parts include a duplicator master, two material control copies and a releasing section copy.

Punched tape is called upon again to complete the production release. For each assembly there is a pre-punched master breakdown tape listing the parts required. Using the basic order information on the release master a clerk in the production control department pulls out the proper breakdown tapes. The release masters are separated from continuous form and placed into a Teletypewriter. Then the tapes are run through to list across the bottom of the form the various parts needed for each assembly ordered.

The quantity of parts required is extended with a desk calculator. The material control copy is given to a production control clerk who prepares a punched card for each item ordered. These cards are entered into the "on order" inventory record stored in our RMAC 305 Computer.

Other copies are filed until the customer's release date. At that time they are given to the assembly foreman who phases production of the assemblies. For this a five-part assembly traveler set is prepared from the duplicator master. In addition to the assembly copy there is a material requisition, a billing authorization, a disbursement copy and production control file copy.

The disbursement copy is used

to prepare another punched card for the computer inventory control program. This time the card tells the RMAC 305 that parts have been taken from stock and that a subtraction should be made accordingly from the available inventory.

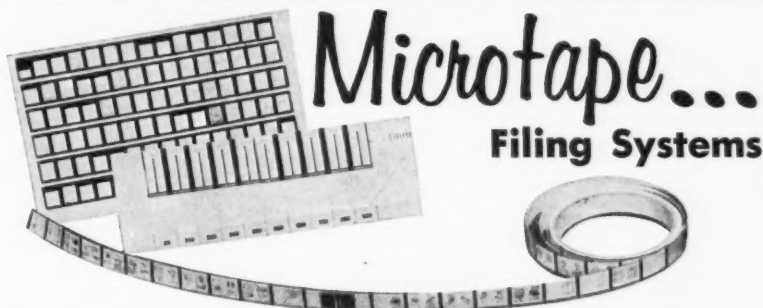
The sales department had previously transmitted an order copy and tape for the billing department's files, set up by work order number. This file folder is now pulled and an operator uses the tape and keys in the billing data to produce an eight-part shipping form, a ten-part invoice (on a second Teletypewriter) and an invoice tape.

The shipping form consists of three inspection certificates, three packing slips, a shipping department file copy and an Air Force invoice copy. The invoice form includes the original invoice, four invoice copies, an accounts receivable copy and a copy for the salesman.

The invoice tape is sent to the machine accounting department, along with the original invoice and its four copies. There the tape is put through a tape-to-card converter to prepare invoice cards. These are extended on IBM equipment, listed, and checked against the invoice extensions. Then the invoices are mailed.

More for Less

The new system enables us to handle a greater volume of orders at no additional expense. Both machines and forms for IDP cost no more than the forms alone for the previous system. But most important is the speed and efficiency provided by IDP. In an era of growing use of Aeroquip products for missiles, aircraft and heavy equipment of all kinds, Aeroquip's service must — and will — keep pace. □



MICROTAPE is designed for business records (systems applications) or single copy or minimum copy uses. It consists of 100' rolls of 16MM or 35MM positive microtext printed from negative rolls having a pressure sensitive adhesive laminated on the back side. These rolls are then cut into proper units and applied to an ordinary index card.

MICROTAPE SYSTEMS 44 LAURA STREET NEW HAVEN, CONN.

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with a LARGE 18" x 24" VIEWING SCREEN featuring . . .

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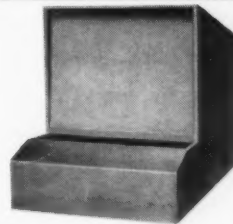
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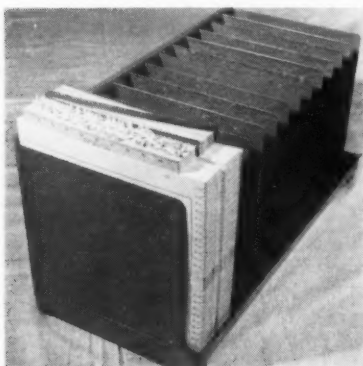
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TERMATREX

continued from page 38



lication of cards for wide dissemination, and low cost read-out.

Even though document storage is entirely separate from the search mechanism in the Termatrex system, a direct tie-in can be effected because both the presentation and read-out of the search results and the document storage have a common geometry.

Represents 100 Documents

For example, each row on a read-out template may represent 100 documents. These 100 documents can be stored on each shelf of a ten-shelf storage bin. By means of a color and numerical code this coincidence could be marked on the read-out mechanism as well as on the storage bins and shelves. This principle of corresponding geometry applies in principle to any type of document storage: full-size storage, Microcard storage, microfilm storage, aperture card storage, etc.

An even closer tie-in of search and storage can be effected by making a geometric print-out of the search results (see Fig. II). This becomes a map of the document storage area; it can be taken from the Termatrex system to the document storage area. The position of documents can be read off and the documents can be retrieved in seconds.

This principle of storage geometry is of great importance to microfilm users since it makes the control of microfilm no more difficult than that of full-size documents. This applies to any size microfilm, microfiches,

Microcards, Microtape microfiches, 105mm drawings, aperture cards, Minicards or any other random access micro-document storage system now under development. □

CONNECTICUT

continued from page 27



ican Microfilm Service of New Haven), microfilmed and Microtaped in the same order that they were in the files originally. The key here is the date of payment. Thus, to get information on a hypothetical John Doe, we first check the Microcard index, get the date paid, go over to the Microtaped claims and quickly have all the data on hand.

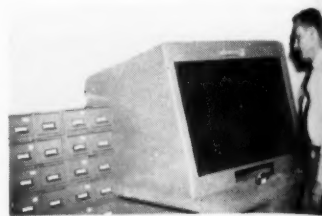
This is a sizable operation. We use approximately 300 Microtape cards each month. These represent 31,800 images (claims plus attached documents). This condenses approximately one-and-one-half inches of claim file space onto one Microcard.

The file of Microtape cards is physically located in a single storage cabinet immediately adjacent to a Microtape reader for simplicity and convenience. This single cabinet replaces rows of conventional filing cabinets that were required previously when the actual claims were retained for years. The reader is available to anyone in the Claims Department who has need of past claims information and its operation requires no special skill.

It all sounds very simple and, like all good ideas and systems, it is. We are very happy with the recording and retrieval pattern we have since it has meant considerable savings in cost, time and space for us. □

KAISER

continued from page 37



run through the whiteprint machine. He uses the copy, and vellum is returned to the files.

The whiteprint is expendable at a cost of approximately 1.5 cents per copy, eliminating any check-out system.

A microfilm number system is used for finding frames quickly on rolls of film and eliminating the problem of refilming. These numbers are consecutive, starting at 00 and continuing to infinity. Five hundred frames are filmed to the roll.

Duplicate "J" prints are made from the negative roll, which are mounted in aperture cards and filed in microfilm number sequence. These cards are used for readers and for enlarging with the original kept in storage for safekeeping.

The use of the microfilm number also makes revisions almost foolproof. Because it is a sequential number, a revision with the same drawing number and file number has a larger microfilm number. A clerk filing a revised copy finds a copy already filed. All the selection needed is to file the copy with the largest number and destroy the old one. A record of the print prior to the revision is contained on the film copies and can be located quickly.

Low Investment Cost

The Ravenswood works maintains its own reproduction center. Total expenditure for capital equipment at the center was \$6,800. This equipment includes a Model "B" Kodak enlarger, a Miller-Trojan vacuum frame, a Leedal print washer, a Pease dryer, storage tanks, trays and sinks. The department can turn out a full-size print from microfilm in 30 minutes when necessary. In practice a day's service is usually sufficient. □

INDUSTRY NEWS

continued from page 6

heat-sensitive material) and reproduce any document on another piece of Kalfax in a matter of seconds.

Other information systems utilizing Kalfax films are said to be in the works from other major manufacturers. One from Litton Industries, Inc. is a high-speed recording system that is said to film images and project them almost instantaneously. This is done with two connected cathode tubes. One "reads" the data to be recorded; the other projects the image onto film that is reeling across the face of a screen.

● Douglas Aircraft Company has sold its controlling interest in Data-graphic Systems, Inc. to the General Aniline and Film Corp. Data-graphic, a developer and marketer of microfilm miniaturization and data handling machines and materials, formerly was owned jointly by Douglas and General Aniline. The latter announced the acquisition as part of the expansion of its Ozalid division which makes duplicating equipment and supplies.

● Smith-Corona-Marchant, Inc. is entering the data processing field with two new products — the Type-tronic 2215, a document preparations system, and the Typetronic 6615, a calculating typewriter.

● A subcommittee on optical scanning of the Life Office Management Association's Automation Committee has called on member companies to design premium billing documents to be processed by a "standardized optical scanner."

● The Microcard Foundation will publish this year the first inclusive list of microform publications. To be called *Guide to Microforms in Print*, it will be issued once a year and list or refer to all publications available in microform (microfilm, Microcard, Microtext, Microlex, Readex Microprint, etc.) from commercial publishers.

● Computers and their related electronic data-processing devices

became the newest billion-dollar industry of the U. S. last year as sales and rentals exceeded that figure for the first time.

● A National 304 Users' Organization has been set up to provide communication and exchange of information between users of the NCR 304 EDP system.

NEW PRODUCTS

continued from page 41

its model 1429 to verify or duplicate punched tapes in any code structure. It automatically duplicates and verifies error-free tapes in one operation. Duplication and/or verification can take place on five to eight channel tapes at the rate of 60 characters per second. An automatic stop will not permit an error character to be punched but instead displays the character in neon indicators which simulate bits and allow the character to be corrected.

Identity Code

122

A unique personal identity code that compresses filing operations has been introduced by IBM. Called AutoPIC, it enables any name to be translated automatically by a computer into a "numerical signature" fifteen characters in length. Other bits of information that may be included in the code include color of hair, eyes, sex and date of birth. Various applications include personnel files, motor vehicle records, mailing lists and tax rolls.

Copy Machine

123

A copying machine, the Royal Royfax Office Copier, has been introduced by Royal McBee Corp. Employing the light diffusion process, it will reproduce documents at the rate of up to 100 per hour from any type of original in any color. A complete line of operating accessories as well as the necessary Royfax reproduction papers has been introduced at the same time.

Automatic Addresser

124

Scriptomatic Inc. has available its Model 10-S Addressing Machine which selectively addresses or skips without disturbing the file sequence. It will also automatically feed, address, count and stack a wide variety of material including 3/16-in. thick magazines. Working from typewritten cards, the unit eliminates duplicate lists and plate costs and saves up to 75% in filing.

Verifax Accessory

125

Several accessory units for use with Verifax copiers have been introduced by the Eastman Kodak Co. The first is a Tabulating Card Shingling Unit which

will fan out 34 tab cards containing one line of written information at the top or bottom, or hold 17 cards which contain three lines of written information. Another accessory is the Verifax Card Grip, a metal steel clamp in which requisition cards can be inserted to build a column of fixed information for purchase orders.

Automated Rotary File

126

Instant access to 6,000 data processing cards is said to be provided with the Wassell Vis-O-Matic. Manufactured by the Wassell Organization, the unit has a selector lever which moves into any of 40 numbered slots to swing the proper vertical panel into position. Each panel holds 75 cards on each side in either the 3" x 7" or 3½" x 7¾" size. The cylindrical unit is only 32" in diameter and comes mounted on the micarta top of a gray steel desk.

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NEWSMAKERS

Gibbs Myers

Seen on our cover in a typical work situation, which is to say hard at work, is the "Systems Man of the Year," Dr. Gibbs Myers, Systems



and Procedures Manager for the Kearfott Division of General Precision, Inc. Dr. Myers won the award at the Fall 1960 International Systems Meeting of the Systems and Procedures Association. With it came an inscribed plaque and citation plus a check for \$1,000.

On our cover he is discussing an EDP installation with (L-R) Sidney P. Herbert, Vice President for Personnel and General Services, and Robert Cassidy, Controller, Kearfott.

A charter member of SPA's Northern New Jersey chapter, Dr. Myers is active in systems research and has authored numerous articles on related systems subjects. A well-known speaker at International Systems meetings, he has also developed two courses on systems for Rutgers University.

The award is made annually to a member of SPA and takes in all phases of participation in chapter and international activities plus personal achievement in the field of systems and procedures. Three regional winners are chosen by SPA and

from this group comes the top winner. In 1960, the best of the best was Dr. Gibbs Myers.

Arthur Even

Arthur D. Even has been one of the busiest newmakers in the systems field for many months. First he won the U.S. Army Commendation for Meritorious Civilian Service for designing an integrated engineering data processing system for the Ordnance Corp. Next, he authored "Engineering Data Processing Systems" for D. Van Nostrand Co. and it was quickly accepted as one of the definitive works of its kind. Now, he has set himself up as an independent consultant on microfilm systems to industry and is no longer with Army Ordnance.

Gilbert Jones

A dramatic new trend in the role of computers during 1961 was forecast this month by Gilbert E. Jones, president of IBM's data processing division.

"Supplementing their historic record-keeping role, computers will be turning more and more to the job of helping management plan and control a business," Mr. Jones said. His prediction is based on the development, last year, of new products, programs and data communication equipment designed to extend the use of computers to the over-all operation of firms of all sizes.

In the planning and control functions, many firms will employ data processing systems to direct and monitor industrial processes such as the distillation of crude oil.

Agencies Film Signal Corps History

Putting 100 years of history and tradition on microfilm is no small job but this task didn't daunt the staffs of the U.S. Library of Congress and the U.S. Army Signal Corps. Seen below are Dr. David C. Mearns, Assistant Librarian for the Library's American Collection, and Dr. George Raynor Thompson,

Chief of the Signal Corps Historical Division on completion of the monumental undertaking. They are exchanging microfilm copies of their respective holdings of papers of Brig. General Albert J. Myer, founder of the century-old Corps. The film exchange gives each institution a complete set of the papers.



DR. DAVID MEARNES (L) exchanges microfilm records with Dr. George Thompson before the U.S. Army Signal Corps Centennial exhibit at the Library of Congress.

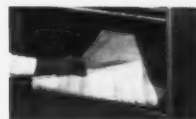


SIMPLE AS A·B·C



A. Operator inserts microfilm aperture card.

B. Next, inserts sheet of ordinary paper, vellum, or offset paper master. Insertion starts automatic printing and processing cycle.



C. First print is automatically delivered in 30 seconds; subsequent prints (of the same or different drawings) every 15 seconds.

The Copyflo® 1824 Printer, using ordinary paper, cuts costs of engineering-drawing reproduction

Here's a remarkable machine that sharply reduces the cost of engineering-drawing reproduction because it uses *ordinary, inexpensive paper*.

The Xerox® Copyflo® 1824 printer, which requires no exposure or other adjustment, reproduces from a microfilm aperture card, making dry, positive, 18" x 24" prints—or smaller—at extremely low cost. It also copies onto vellum or offset paper masters.

Operation is automatic. Prints ready for immediate use emerge as fast as four a minute.

The quality of reproduction is superb. Images are sharp black-on-white and won't rub off. There is no odor,

no waste, and the finished print may be written on with pen or pencil.

Regardless of your engineering-drawing-reproduction needs, you can now enjoy the tremendous savings in time, money, space, and materials of your own unitized microfilm system.

Formerly, such economies required a substantial reproduction need. Today, however, the Copyflo 1824 printer offers the same proportionate benefit to small-volume users as to large. No need now for vast files of engineering drawings. Microfilm aperture cards require only a fraction of the storage space required for other reproducible. No more costly waiting for

prints, which—made by a Copyflo 1824 printer—are so inexpensive your engineers can discard them after use.

Write today for our free 1824 booklet giving the full benefits you can expect from a Copyflo 1824 printer. HALOID XEROX INC., 61-133X Haloid St., Rochester 3, N. Y. Branch offices in principal U.S. and Canadian cities. Overseas: Rank Xerox Ltd., London.

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